# City of Manteca Climate Action Plan Update

Prepared for City of Manteca



**July 2025** 

Prepared by



### City of Manteca Climate Action Plan Update

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# 1. Introduction

#### 1. Introduction

California has affirmed the need for action to reduce Statewide greenhouse gas (GHG) emissions through the adoption of multiple executive orders under Governors Arnold Schwarzenegger, Jerry Brown, and Gavin Newsom, as well as legislative actions including Assembly Bill (AB) 32, Senate Bill (SB) 32, and Executive Order (EO) B-55-18. Both AB 32 and SB 32 establish Statewide GHG reduction goals, while EO B-55-18 commits to carbon neutrality. The majority of the reductions mandated by AB 32 and SB 32 would be accomplished through Statewide programs; however, implementation of local measures to reduce GHG emissions will likely be needed to achieve the Statewide reductions mandated by AB 32, SB 32, and EO B-55-18. The City of Manteca's efforts regarding GHG emissions reductions are intended to work in concert with the efforts being undertaken on a Statewide level. Thus, the City of Manteca has prepared an update to their existing Climate Action Plan (CAP), implementation of which would establish consistency between the City of Manteca's policies and Statewide reduction requirements.

#### 1.1 PURPOSE AND SCOPE OF THE CAP UPDATE

This CAP Update is intended to support the sustainable development of the City and continued economic prosperity of the region by reducing GHG emissions in an attempt to curtail the anticipated impacts resulting from climate change. In doing so, the CAP Update would streamline future environmental review of development projects in the City of Manteca by following the California Environmental Quality Act (CEQA) Guidelines for a Qualified GHG Reduction Strategy. The CAP Update will also identify how the City will achieve consistency with the Statewide emissions limits and the 2022 Scoping Plan Update prepared by the California Air Resources Board (CARB).

#### **Public Outreach**

As a part of the planning process of the CAP Update, the City conducted public outreach efforts in order to incorporate input from the community. The City increased engagement through public meetings, online surveys, and recommendations from the Climate Action Plan Advisory Committee (CAPAC). The CAPAC was created by the City Council selecting five members of the community to generate feedback from the community about various topics, and act as the primary channel for the community to provide input for the CAP Update. The CAPAC met regularly from September 2023 to March 2025 which allowed for regular discussion on the appropriate goals and actions for the City of Manteca.

The following sections summarize the content included in the chapters of this CAP Update.

#### **Expected Regional Climate Change Impacts**

The City of Manteca has identified potential climate change impacts specific to the City and the surrounding region. In general, climate change has begun shifting precipitation patterns and surface temperatures away from the reliable historic patterns that human society has come to rely on. For instance, climate change may result in increased surface air temperatures throughout the City of Manteca and surrounding regions. Increased surface air temperatures can result in human health effects such as heat exhaustion and heat stroke, as well as increased rates of respiratory

problems related to exacerbated air pollution and increased costs to businesses related to higher demands for landscaping or agricultural irrigation. Increased surface air temperatures represent only one of many potential regional impacts related to climate change. Other potential impacts may include, but are not necessarily limited to, reduced agricultural productivity, increased public health risks, and decreased availability of water resources. An in-depth discussion of such regional impacts is included in Chapter 4 of this CAP Update.

#### **GHG Baseline Inventory**

In 2013, the City of Manteca adopted a CAP in which a 2005 GHG inventory was used to generate forecasted emissions. The GHG inventory contained emissions from municipal government operations and the community. Emission inventories compile the variety of emissions generated within a geographic area during a given period. These inventories provide quantifiable insights into emissions of a variety of sectors, such as transportation, solid waste, energy, and wastewater. The baseline inventory presented in the City's 2013 CAP estimated emissions for the year 2005, which will be presented in Chapter 5, Emissions Quantification, of this CAP Update.

Since the preparation of the 2013 CAP, the City of Manteca recognized the need for up-to-date and accurate emissions data. Significant progress has been made to refine and improve the methodology for emissions estimation since the previous CAP. The most recent 2020 GHG inventory relied on the most up-to-date methodology provided by the Statewide Energy Efficiency Collaborative (SEEC). SEEC is an alliance of private companies, public utility companies, and non-governmental organizations that provide information and technical assistance to California cities and counties to aid in the reduction of GHG emissions and increase in energy efficiency.

To facilitate such goals, the SEEC prepared ClearPath California. ClearPath California is a suite of tools designed to measure and track GHG emissions within communities in California. Based on user-provided data such as community energy use, vehicle use, water consumption, wastewater treatment, and solid waste generation, ClearPath provides GHG inventories for both the operation of municipal governments and the larger community that such municipalities serve. The CAP Update relies on information provided by various departments within the City of Manteca, including regarding the City's vehicle fleet, solid waste division, water and wastewater infrastructure, and facilities. Further information used in drafting this CAP Update was provided by Cal-Waste, Medical and Transportation Management (MTM) Transit, and the South San Joaquin Irrigation District (SSJID).

In addition to the inventory of GHG emissions, ClearPath provides a centralized platform for forecasting future GHG emissions and planning for the control and reduction of emissions. Further discussions regarding emissions forecasting is provided in Chapter 5 of this CAP Update, while information regarding the control and reduction of GHG emissions is presented in Chapter 6 of this CAP Update.

#### **GHG Emissions Forecasting and Reduction Targeting**

Forecasting of future emissions for the City of Manteca is based on buildout of the City's adopted General Plan. Buildout of the City's adopted General Plan will involve growth within the City in the form of new development and population growth. Based on the City's estimated growth rates, future population, and existing GHG emissions, ClearPath can generate emissions estimates for

<sup>&</sup>lt;sup>1</sup> City of Manteca. 2043 Manteca General Plan. February 2024.

various future dates. In compliance with Statewide reduction targets set by AB 32, SB 32, and EO B-55-18, and in keeping with the methodology for emissions estimations presented in the State's 2022 Scoping Plan Update, emissions estimates for the years 2030 and 2045 were prepared for the City of Manteca.

As further discussed in Chapter 5, of this CAP Update, the State's 2022 Scoping Plan Update recommends that local governments set future emissions goals in alignment with achieving carbon neutrality. Specifically, the 2022 Scoping Plan Update aims for 2030 emissions to not exceed 40 percent below 1990 levels, and for Statewide emissions to reach carbon neutrality by 2045. The 2022 Scoping Plan Update builds upon and remains consistent with the Statewide emissions limits established by AB 32, SB 32, SB 391, and EO S-3-05 and EO B-55-18.² Based on the City's adopted General Plan, the future population of the City of Manteca was estimated for the years 2030 and 2045, which, when combined with the expected thresholds presented in the 2022 Scoping Plan Update, allowed for the establishment of maximum emissions levels for the years 2030 and 2045.

The difference between the estimated emissions for the years 2030 and 2045, as forecasted by ClearPath and discussed above, and the maximum emissions quantified in compliance with the State's 2022 Scoping Plan Update provides a level of GHG emissions reductions necessary to ensure that growth within the City of Manteca occurs in compliance with State-identified emissions reduction goals. Achievement of such emissions reduction goals is a crucial means of protecting the City from the potential negative effects of climate change discussed in Chapter 4 of this CAP Update.

Details regarding the methodologies, calculations, and results of emissions forecasting and reduction targeting are presented in Chapter 5 of this CAP Update.

#### **GHG Emissions Reduction Measures and Implementation**

This CAP Update includes measures to reduce GHG emissions that could otherwise result from local government and community-wide activities within the City of Manteca. The measures are organized into focus areas, each of which address the major sources of emissions associated with the City.

Emissions reduction measures included in Chapter 6 of this CAP Update will be implemented through actions undertaken by the municipal government of the City of Manteca, or by private landowners and developers within the City. Requirements for future development to adhere to this CAP Update will be identified in a Sustainability Checklist prepared in compliance with this CAP Update. The Sustainability Checklist will be included within the City's project review process.

#### 1.2 PLAN AREA AND LOCAL SETTING

The City of Manteca is located at the intersection of State Route (SR) 99 and State Route (SR) 120 in California's Central Valley, between the cities of Stockton and Modesto. The City was formally incorporated May 28<sup>th</sup>, 1918, with historical roots in agriculture that continue to play an important role in Manteca's economy to this day. Alive with opportunity, the City of Manteca takes pride in being the Family City. Manteca is one of California's fastest growing cities with an expanding community.

<sup>&</sup>lt;sup>2</sup> California Air Resources Board. 2022 Scoping Plan for Achieving Carbon Neutrality. December 2022.

Major commercial growth is located along the SR 120 and SR 99 interchange, and along the SR 120 corridor. The downtown area, the traditional main street development, remains along East Yosemite Avenue and North Main Street. Residential development continues to expand to accommodate the increasing rate of population growth. The majority of agricultural land remains around the boundaries of the City, which can be seen in Figure 1 below.

This CAP Update pertains to all areas of the City included within the City of Manteca's General Plan Boundary, as shown in Figure 1 below, which is coterminous with the City's Sphere of Influence. Generally, the General Plan Boundary extends from Ripon Road and Sedan Road in the south, French Camp Road in the north, Prescott Road and unnamed roads in the east, and the Union Pacific Railway in the west.

#### 1.3 LOCAL AND REGIONAL PLANNING

New development and redevelopment within the City of Manteca must adhere to a number of City policy documents, building code requirements, development standards, design guidelines, and standard practices that collectively further the goals and actions included in the CAP Update. Below is a non-exhaustive list of those measures, which are applied on a project-by-project basis, and which will aid in implementing the CAP Update:

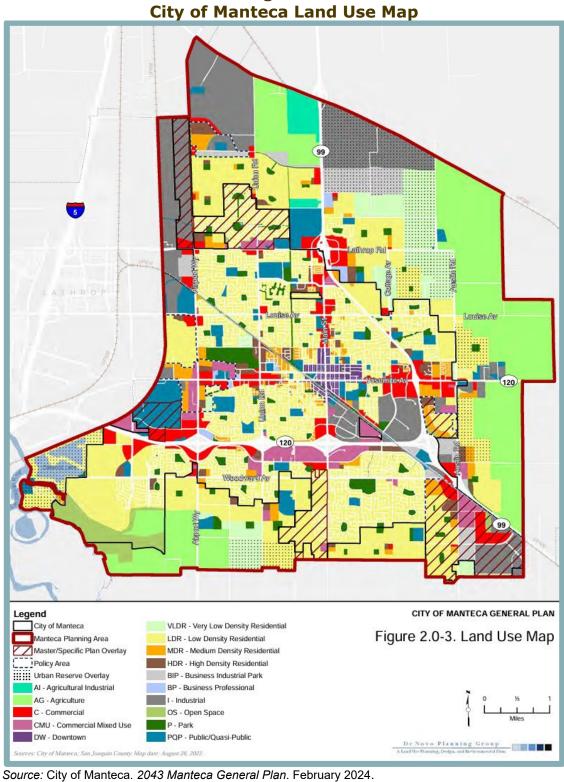
- Compliance with California's Title 24 Building Energy Efficiency Standards for Residential and Non-Residential Buildings;
- Compliance with Section 12.08.120 of the City's Municipal Code and General Plan Policy RC-8.6 related to tree preservation;
- Incorporation of street trees and landscaping consistent with the City's Municipal Code;
- Consistency with the State's Water Efficient Landscape Ordinance (AB 1881); and
- Provision of bicycle facilities and pedestrian infrastructure consistent with the City's 2020 Active Transportation Plan.

Within the broader region, San Joaquin Valley Air Pollution Control District (SJVAPCD) adopted the Climate Change Action Plan: Addressing GHG Emissions Impacts under CEQA (Communitywide CAP) in August of 2008.<sup>3</sup>

In addition to the City and SJVAPCD, various other local agencies provide guidance and regulations pertaining to air quality and GHG emissions. The City of Manteca is within the boundaries of the San Joaquin Valley Air Basin (SJVAB) and under the jurisdiction of the SJVAPCD. The SJVAPCD is responsible for monitoring air pollution within the SJVAB and for developing and administering programs to reduce air pollution levels below the health-based standards established by the State and federal governments. As part of SJVAPCD's efforts to reduce GHG emissions within the district in compliance with AB 32 and SB 32, SJVAPCD has adopted thresholds of significance for GHG emissions from new projects based on a three-tiered approach related to project size. SJVAPCD's thresholds for land development and construction projects range within each tier, dependent on the project's units and square footage.

San Joaquin Valley Air Pollution Control District. *Climate Change Action Plan: Addressing GHG Emissions Impacts under CEQA*. August 2008.

Figure 1



Development in the City of Manteca is also subject to the regulations of the San Joaquin Council of Governments (SJCOG). SJCOG is an association of local governments in San Joaquin County. Its members include the cities of Stockton, Lodi, Manteca, Mountain House, Tracy, Ripon, Escalon, and Lathrop. As the designated metropolitan planning organization for the region, SJCOG is responsible for ensuring that transportation projects and plans do not impede the region's clean air goals.

In addition, SJCOG is responsible for publishing and regularly updating the San Joaquin Valley region's Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). Consistent with SB 375, the RTP/SCS is intended to integrate land use and transportation planning to ensure that new and existing development is able to meet the GHG reduction goals established in relevant State legislation, including AB 32 and SB 32. Projects that are consistent with the adopted RTP/SCS are eligible for CEQA streamlining. The environmental analysis for projects that are consistent with the adopted MTP/SCS need not analyze GHG emissions from cars and light duty truck trips related to the project.

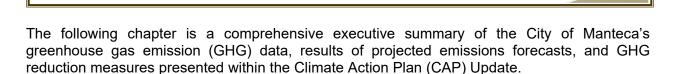
#### 1.4 USING THE CAP

To ensure the success of this CAP Update, the City will integrate the goals and strategies of this CAP Update into other local plans, programs, and activities, as feasible. As the City moves forward with updates to the Municipal Code, various specific plans, updates to the City's Housing Element, and other planning documents, City staff will ensure that such documents support and are consistent with the CAP Update. Implementation of the CAP Update will also require City leadership to execute strategies and report on the progress of implementation.

For measures to be implemented by the municipal government, this CAP Update identifies the responsible department for each measure and offers time frames for implementing each strategy. Successful implementation requires regular monitoring and reporting. City staff will rely on ClearPath's long-term implementation monitoring tools to track implementation progress and report to the City Council. Details regarding future updates to this CAP Update, as well as the incorporation of CAP consistency analyses in future development projects, are presented in Chapter 7, Implementation, of this CAP Update.

## 2. EXECUTIVE SUMMARY

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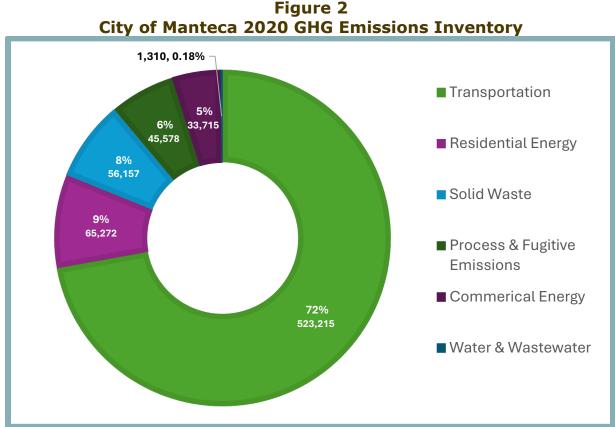


#### 2.1 CITY OF MANTECA CAP OVERVIEW

The City of Manteca has identified the need for a CAP Update to reduce GHG emissions; thus, limiting the City's contribution to climate change impacts and ensuring continued prosperity, public health, and economic growth. Through the continual application of the CAP Update measures, contained within Chapter 6, the City aims to achieve the State's GHG reduction targets.

#### **GHG Emissions Inventory**

The 2020 GHG Inventory update concluded the City of Manteca resulted in a total of 730,202 metric tons of carbon dioxide equivalent (MTCO2<sub>e</sub>) in 2020. Figure 2 below shows a breakdown of the MTCO2e by sector.



Source: Clearpath, 2024.

#### **Manteca Projected GHG Emissions Forecasts**

Projected future emissions for Manteca were created through data collected on estimated population growth, sector related emissions, and emission rate factors. Current federal, state and local regulations and policies were accounted for and incorporated into the projections. Forecasted emissions are shown below for the target years 2030 and 2045 in Figure 3 below.

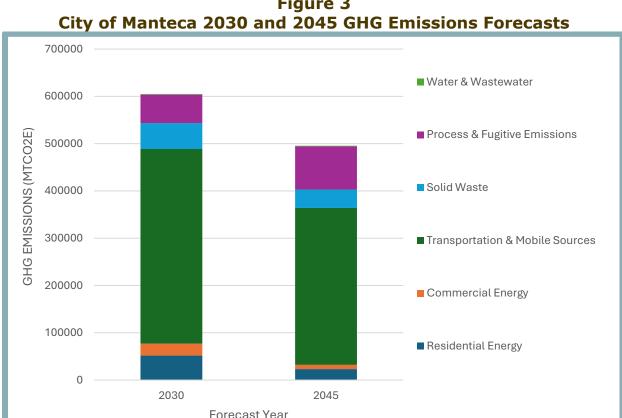


Figure 3

Note: Regulations and policies were accounted for and incorporated into the projections. Source: Clearpath, 2024.

#### **Manteca GHG Emissions Targets**

The City of Manteca has set the following GHG emissions reduction goals in alignment with the State's climate goals, using the 2020 GHG Inventory as the baseline. The following targets were established by Senate Bill (SB) 32, Assembly Bill (AB) 32, and various executive orders.

- o Reduce GHG emissions by 40 percent below 1990 levels by 2030; and
- Aim to achieve carbon neutrality by 2045.

Additionally, during the development of the CAP Update the Climate Action Plan Committee (CAPAC) developed State-recommended efficiency metrics (MTCO2e/capita) in alignment with the previously stated targets.

- o Reduce GHG emissions to 6 MTCO2e/Capita by 2030; and
- o Aim to achieve carbon neutrality by 2045.

The measures and actions within the CAP Update provide the GHG emissions reduction to achieve the 2030 goal. In the longer term, these measures do not yet achieve the 2045 goal of net neutrality. The Manteca CAP shall continually update the CAP on a five-year basis, therefore the future additions of new measures, actions, and legislation would be implemented to close the gap to achieve carbon neutrality. A comparison of the resulting emissions from each forecast are shown below in Figure 4.

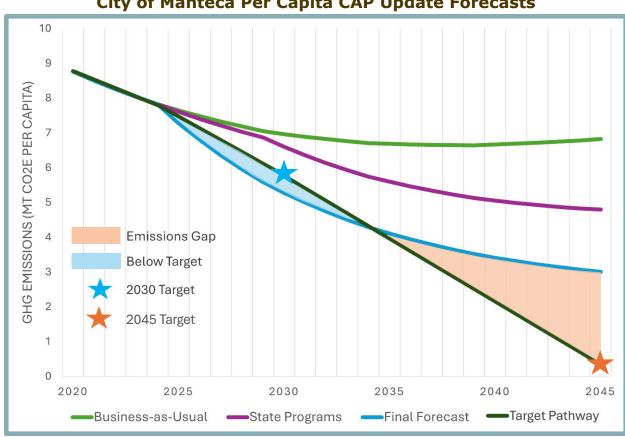


Figure 4
City of Manteca Per Capita CAP Update Forecasts

Source: Clearpath, 2024.

#### **Reduction Measures Summarized**

The goals and measures listed below in Table 1 summarize the actions which have been reviewed and developed by the CAPAC to reach the reductions targets discussed above.

#### **EXHIBIT A**

Table 1 CAP Goals and Measures Summary					
GOALS	MEASURES	<b>Total Reductions</b>			
	Transportation (TR)				
Promote Alternative Transportation	TR.3: Increase Use of Alternative Transportation TR.4: Promote Alternative Transportation Through Updated Parking Standards	TR.3: 1,330 MTCO2 <sub>e</sub> TR.4: 71,011 MTCO2 <sub>e</sub>			
Implement Electric Vehicle Infrastructure	TR.5: Optimize City Fleet TR.6: Support Electric Vehicle Adoption, Charging Infrastructure, and Alternative Fuels.	TR.5: 1,815 MTCO2 <sub>e</sub> TR.6: 213,034 MTCO2 <sub>e</sub>			
Work to Increase Active Mobility	TR.1: Bicycle and Pedestrian Infrastructure Improvement TR.9: Safe Routes to School	TR.1: 148 MTCO2 <sub>e</sub> TR.9: 89 MTCO2 <sub>e</sub>			
Reduce Single Occupant Vehicle Use and Emissions	TR.2: Congestion Management TR.7: Establish a Transportation Management Association TR.8: Mobile and Area Source Emissions Reductions	TR.2: 142,022 MTCO2 <sub>e</sub> TR.7: 798 MTCO2 <sub>e</sub> TR.8: 31,417 MTCO2 <sub>e</sub>			
	Land Use (LU)				
Encourage Sustainable Growth	LU.1: Encourage Adaptive Reuse LU.2: Comply with State Affordable Housing Requirements LU.3: Sustainable Growth of New Development LU.4: Urban Tree Management Plan	LU.1: 1,605 MTCO2 <sub>e</sub> LU.2: Supportive LU.3: 4,816 MTCO2 <sub>e</sub> LU.4: Supportive			
E	nergy and Building Design (EG)				
Expand Renewable Energy	EG.1: Renewable Energy Production Plan EG.3: Renewable Energy Requirement for Private Development EG.4: Participate in Energy Programs	EG.1: 8,025 MTCO2 <sub>e</sub> EG.3: 38,747 MTCO2 <sub>e</sub> EG.4: 1,711 MTCO2 <sub>e</sub>			
Increase Lighting Efficiency	EG.8: Improve Lighting Efficiency	EG.8: 169 MTCO2e			
Improve Building Design	EG.2: Resource Efficiency Improvements for City Buildings EG.5: Enforce CALGreen EG.6: Energy Efficient Design EG.7: Efficient Design of City Structures	EG.2: 27 MTCO2 <sub>e</sub> EG.5: 11,180 MTCO2 <sub>e</sub> EG.6: 61,390 MTCO2 <sub>e</sub> EG.7: 38,149 MTCO2 <sub>e</sub>			
Water Conservation (WC)					
Increase Water Efficiency	WC.1: Community Wide Water Use Efficiency WC.2: Water Efficient Landscape WC.3: Sustainable Water Service	<u>WC.1</u> : 585 MTCO2 <sub>e</sub> <u>WC.2</u> : 91 MTCO2 <sub>e</sub> <u>WC.3</u> : 606 MTCO2 <sub>e</sub>			
Solid Waste Management (SW)					
Increased Waste Diversion  Source: Clearpath, 2024	SW.1: Expand Municipal Recycling Program SW.2: Expand Yard Waste and Other Organics Composting SW.3: Improve Waste Management Practices.	SW.1: 115 MTCO2 <sub>e</sub> SW.2: 34,758 MTCO2 <sub>e</sub> SW.3: 26,752 MTCO2 <sub>e</sub>			

Source: Clearpath, 2024.

# 3. CLIMATE CHANGE SCIENCE AND BACKGROUND

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The following chapter provides a brief overview of the scientific understanding of the Earth's climate system, with specific focus on the principles of climate change. The regulatory framework on a federal, state, and local level are described below.

#### 3.1 PRINCIPLES OF THE EARTH'S CLIMATE

Although sometimes used interchangeably, the terms "climate" and "weather" represent two related, but different concepts. Weather refers to the immediate state of the atmosphere. Questions such as, "is it hot or cold outside right now"; "what is the humidity today; and how cloudy will it be this afternoon" are all concerned with the day-to-day conditions of the atmosphere. Climate, on the other hand, is the average of a given location's weather over time. Because climate information is considered on a longer temporal time scale than weather, climate is often discussed in statistical terms and can be used to answer such questions as "what is the average temperature in the City of Manteca during the month of June"; "how many inches of rain does the City of Manteca receive each year"; and "what month is usually the coldest month of the year in the City of Manteca?" Because climate is the pattern of weather over a given time, questions regarding climate can be spatially and temporally broad. For instance, discussions on climate can focus on the City of Manteca, California, North America, or the entire globe, and can concern periods of weeks, years, decades, millennia, and beyond.<sup>4</sup>

Understanding a region's climate provides important insights into a region's average weather, as well as a region's likelihood of experiencing extreme weather events such as heat waves, storms, floods, and droughts.<sup>5</sup> Extreme weather events are often the most attention-grabbing features of a region's climate (consider drought in California or hurricanes in Florida); however, average climactic conditions can also greatly impact a region's suitability for agriculture, forestry, and general human habitation. For instance, California's Mediterranean-type climate, with mild wet winters and dry summers, makes the State uniquely suited to agricultural activities.

#### **Factors Controlling Earth's Climate**

Considering the importance of the region's climate to our society, we must understand the factors that affect climate. The City of Manteca's climate is interconnected with the climate of the State, continent, and globe in what is called a climate system. The main driver of the Earth's climate system, and, thus, the continent's, State's, and City's climate, is energy radiated by the sun hitting the Earth.<sup>6</sup> Several factors can alter the amount of solar energy hitting the earth such as the

National Snow & Ice Data Center. Artic Weather and Climate. Accessible at: https://nsidc.org/learn/parts-cryosphere/arctic-weather-and-climate#anchor-what-is-the-difference-between-weather-and-climate. Accessed December 2024.

<sup>5</sup> U.S. Global Change Research Program. GlobalChange.gov. Accessible at: <a href="http://www.globalchange.gov/">http://www.globalchange.gov/</a>. Accessed November, 2024.

Masson-Delmotte, V., M. Schulz, A. Abe-Ouchi, J. Beer, A. Ganopolski, J.F. González Rouco, E. Jansen, K. Lambeck, J. Luterbacher, T. Naish, T. Osborn, B. Otto-Bliesner, T. Quinn, R. Ramesh, M. Rojas, X. Shao and A.

distance of the earth from the sun, the intensity of solar activity, and the tilt of the earth on the earth's axis. However, these factors are generally stable and act on what is known as a geologic timescale, often discussed in hundreds of thousands, to millions and billions of years. Because such factors are stable and predictable, the amount of solar energy hitting the earth is known and has been relatively constant over much of human history.<sup>7</sup>

Although humans cannot change the amount of solar energy reaching the Earth, humans can alter how much of this incoming heat remains. The Earth's atmosphere functions as a natural heat regulation system by balancing incoming solar energy from the sun and outgoing thermal radiation, which is first absorbed from the sun and then re-emitted by the land, oceans, and atmosphere. This naturally occurring phenomenon, known as the greenhouse effect, enables the Earth to have equilibrium temperatures supportive of life.

Certain gases intensify the greenhouse effect, however, by trapping thermal radiation and not emitting them out into space again – like a blanket or the walls of a greenhouse. Greenhouse gases (GHGs) include water vapor, carbon dioxide ( $CO_2$ ), methane ( $CH_4$ ), nitrous oxide ( $N_2O$ ), ozone ( $O_3$ ), and fluorinated gases (such as hydrofluorocarbons or HFCs). The higher the concentration of GHGs in the atmosphere, the thicker the glass walls of the greenhouse, and the more heat is trapped on Earth. This is illustrated in Figure 5 below.

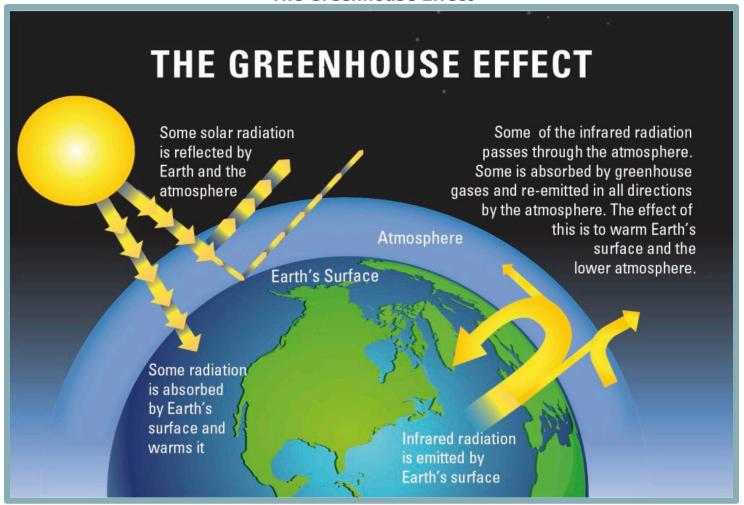
On a geological timescale, over hundreds of thousands of years, the Earth has cycled between cooler periods of glaciation (ice ages) and warmer interglacial periods. Natural changes in the atmospheric concentration of carbon dioxide and other GHGs contributed to these gradual changes in the Earth's average temperatures and climate conditions, with higher levels of GHGs associated with warmer, tropical periods and lower levels linked to ice ages.8 While the amount of GHGs in the atmosphere has fluctuated naturally in the Earth's past, they are now rising at unprecedented rates. Human activities contributing to the rising rates include the burning of fossil fuels (coal, gasoline, and natural gas), land conversion, industrial processes (e.g., cement production and artificial nitrogen fixation for fertilizer), food production, and many other daily activities. The above human activities have been releasing vast quantities of GHGs into the atmosphere continuously since the Industrial Revolution (Figure 6 and Figure 7). The increases of GHGs in the atmosphere can be thought of as thickening the glass walls of the Earth's greenhouse, causing more and more heat to be trapped within the Earth's system. This leads to warmer global average temperatures (see Figure 7 and Figure 8), which in turn contributes to rising sea levels, more droughts, and more extreme weather conditions due to the added energy in the global climate systems (Figure 7).

Timmermann, 2013: *Information from Paleoclimate Archives. In: Climate Change 2013: The Physical Science Basis.* Contribution of Working Group I to the Fifth Assessment Report of The Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

National Aeronautics and Space Administration. *Paleoclimatology: Explaining the Evidence*. Available at: <a href="http://earthobservatory.nasa.gov/Features/Paleoclimatology">http://earthobservatory.nasa.gov/Features/Paleoclimatology</a> Evidence/. Accessed November, 2024.

Masson-Delmotte, V., M. Schulz, A. Abe-Ouchi, J. Beer, A. Ganopolski, J.F. González Rouco, E. Jansen, K. Lambeck, J. Luterbacher, T. Naish, T. Osborn, B. Otto-Bliesner, T. Quinn, R. Ramesh, M. Rojas, X. Shao and A. Timmermann, 2013: *Information from Paleoclimate Archives. In: Climate Change 2013: The Physical Science Basis.* Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

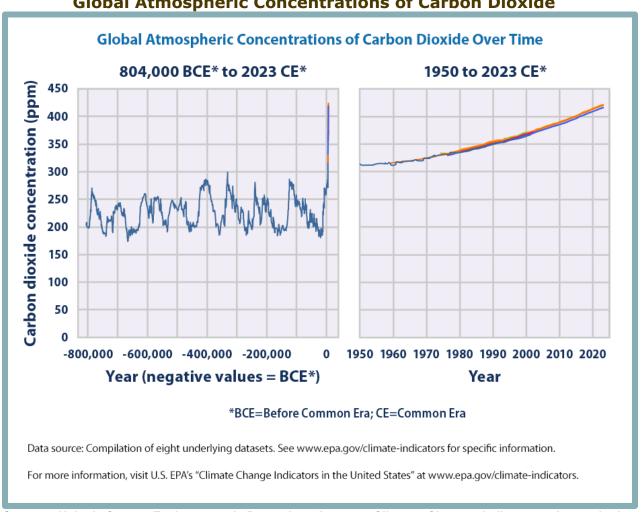
Figure 5
The Greenhouse Effect



Source: The Royal Society. The Basics of Climate Change. Available at: https://royalsociety.org/topics-policy/projects/climate-change-evidence-causes/basics-of-climate-change/. Accessed November 2024.

Current GHG levels are at their highest in the past 800,000 years – before modern humans appeared on Earth – and continue to increase at unprecedented rates. Human society depends on stable, predictable climate patterns. At lower concentrations, GHGs retain heat within the atmosphere to provide the stable climate that humans rely upon. However, human activities across the globe are drastically altering the Earth's atmospheric composition by causing large increases in GHG concentrations, mainly  $CO_2$  but also methane, nitrous oxide, and fluorinated gases.

Figure 6
Global Atmospheric Concentrations of Carbon Dioxide



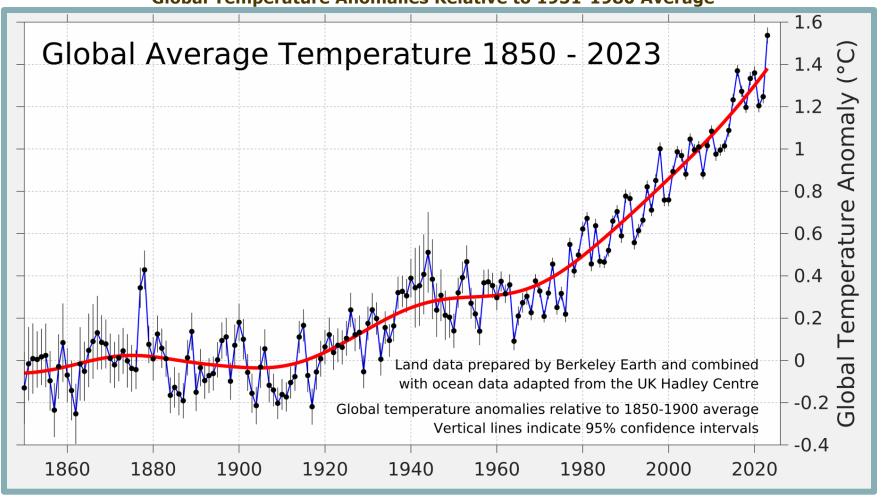
Source: United States Environmental Protection Agency. Climate Change Indicators: Atmospheric Concentrations of Greenhouse Gases. Available at <a href="https://www.epa.gov/climate-indicators/climate-change-indicators-atmospheric-concentrations-greenhouse-gases">https://www.epa.gov/climate-indicators/climate-change-indicators-atmospheric-concentrations-greenhouse-gases</a>. Accessed December 2024.

(a) Globally averaged combined land and ocean surface temperature anomaly 0.2 ()<sub>(</sub>) -0.6-0.81850 1900 1950 2000 Year Globally averaged sea level change (b) 0.05 E -0.05 -0.1-0.151850 1900 1950 2000 Year (c) Globally averaged greenhouse gas concentrations 400 380 360  $CO_2$  (ppm) 1800 340 1600 320 1400 310 300 1200 290 300 1000 280 800 280 270 ك 1950 2000 1900 Year Cumulative CO<sub>2</sub> Global anthropogenic CO<sub>2</sub> emissions (d) Quantitative information of CH<sub>4</sub> and N<sub>2</sub>O emission time series from 1850 to 1970 is limited emissions 40 Fossil fuels, cement and flaring 2000 35 Forestry and other land use 30 1500 (GtCO<sub>2</sub>/yr)25 20 15 500 0 2000 1750 1750 1850 1900 1950 Year 1970 2011

Figure 7
Temperature, Sea Level, and Atmospheric GHGs Since 1850

Source: IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp. 2014.

Figure 8
Global Temperature Anomalies Relative to 1951-1980 Average



Source: Berkeley Earth. Global Temperature Report for 2023. Available at: https://berkeleyearth.org/global-temperature-report-for-2023/. Accessed November 2024.

Such human-induced changes to atmospheric GHG concentrations are increasing average land and ocean temperatures, contributing to rising sea levels (Figure 7), and threaten to alter the earth's climate system. As a result, the last decade has been the hottest, on both land and sea, since 1880, with 2024 resulting in the warmest average surface temperature on record. In addition, carbon sinks, such as the ocean, soil, and forests, thought prior to be a steady factor in climate modeling have become increasingly unreliable as widespread impacts from climate change disrupt the processes which produce the carbon sinks. In Unprecedented amounts of sea level rise result from the melting of ice sheets and thermal expansion of sea water as a result of rising global temperatures. While the impacts are widespread, the City of Manteca plans to reduce citywide emissions and join in California's goal of carbon neutrality.

The City's CAP update will chart a course forward for the City of Manteca, which will focus on measures that will encourage growth, and economic opportunity, while also encouraging climate change protection throughout the community. In balancing the economic needs of today with the safety and prosperity of future generations, the actions of the City of Manteca, combined with Statewide and global initiatives to reduce GHG emissions, will allow for on-going prosperity without diminishing the ability of future generations to enjoy the same standard of living.

#### **Development of Technology**

Within the applicable timeline of this CAP Update, technology related to reducing GHG emissions, such as carbon sequestration, will continue to improve and become increasingly accessible. The application of these future technologies could aid in mitigating the impacts of climate change and achieving carbon neutrality as discussed below in the 2022 Scoping Plan Update. The CAP Update will be updated and amended on a five-year basis. Therefore, the application of new technology will be considered, as feasible, for the City of Manteca.

#### 3.2 REGULATORY SETTING

The regulations listed below support the 2022 Scoping Plan Update, which lays out a path to achieve the targets for carbon neutrality by 2045, while assessing the progress toward reducing California's GHG emissions by at least 40 percent below 1990 levels by 2030, as called for in SB 32 and laid out in the previous 2017 Scoping Plan. GHG emissions are monitored and regulated through the efforts of various international, federal, State, and local government agencies. Agencies work jointly and individually to reduce GHG emissions through legislation, regulations, planning, policymaking, education, and a variety of programs. The agencies responsible for regulating GHG emissions within the City of Manteca's Planning Area are discussed below.

- <sup>9</sup> IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.
- NASA. Temperatures Rising: NASA Confirms 2024 Warmest Year on Record. Available at <a href="https://www.nasa.gov/news-release/temperatures-rising-nasa-confirms-2024-warmest-year-on-record/#:~:text=Global%20temperatures%20in%202024%20were,records%20%E2%80%94%20an%20unprecedented%20heat%20streak. Accessed April, 2025.</p>
- The Guardian. *Trees and land absorbed almost no CO2 last year. Is nature's carbon sink failing?* Available at <a href="https://www.theguardian.com/environment/2024/oct/14/nature-carbon-sink-collapse-global-heating-models-emissions-targets-evidence-aoe">https://www.theguardian.com/environment/2024/oct/14/nature-carbon-sink-collapse-global-heating-models-emissions-targets-evidence-aoe</a> Accessed April, 2025.
- 12 NASA. NASA Analysis Shows Unexpected Amount of Sea Level Rise in 2024. Available at https://sealevel.nasa.gov/news/282/nasa-analysis-shows-unexpected-amount-of-sea-level-rise-in-2024/#:~:text=Global%20sea%20level%20rose%20faster.(0.43%20centimeters)%20per%20year. Accessed April, 2025

#### **Federal Regulations**

The most prominent federal regulation related to GHG emissions is the Federal Clean Air Act (FCAA), which is implemented and enforced by the United States Environmental Protection Agency (USEPA). Due to uncertainties related to federal regulations, as the CAP Update is applied and updated on a five-year basis, applicable federal regulations will be updated as developments occur.

#### **State Regulations**

The Statewide GHG emissions regulatory framework is summarized below. The following text describes Executive Orders, legislation, regulations, and other plans and policies that would directly or indirectly reduce GHG emissions and/or address climate change issues. The following discussion does not include an exhaustive list of applicable regulations; rather, only the most prominent and applicable California legislation related to GHG emissions. An exhaustive list and extensive details of California air quality legislation can be found at the California Air Resources Board (CARB) website. Additionally, due to uncertainties related to state regulations, as the CAP Update is applied and updated on a five-year basis, applicable state regulations will be updated as developments occur.

#### Assembly Bill (AB) 1007

AB 1007, State Alternative Fuels Plan (Pavley, Chapter 371, Statutes of 2005), required development and adoption of a State plan to increase the use of alternative fuels. The final State Alternative Fuels Plan was adopted on December 5, 2007 and presented strategies and actions California must take to increase the use of alternative, non-petroleum fuels in a manner that minimizes costs to California and maximizes the economic benefits of in-state production. Examples of such strategies include establishment of government incentive programs for alternative fuels, creation of a Low Carbon Fuel Standard to reduce the carbon intensity of transportation fuels, and the allowance of GHG emissions credits to entities using alternatively fueled vehicles. The plan assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuels use, reduce GHG emissions, and increase in-state production of biofuels without causing a significant degradation of public health and environmental quality. The Plan recommended goals for alternative fuel use as well as reductions in the carbon intensities of fuels such as gasoline and diesel, and lays a foundation for building a multi-fuel transportation energy future for California by 2050. As of 2017, decreases in the carbon intensity of conventional fuels have met or exceeded the compliance targets, and the use of alternative fuels has increased by approximately 800 million gallons of gas equivalence units. 14

#### Assembly Bill 1493

AB 1493 (Pavley) (July 2002) was enacted in response to the transportation sector accounting for more than half of California's CO2 emissions. AB 1493 required CARB to set GHG emission standards for passenger vehicles, light-duty trucks, and other vehicles determined by the State

California Air Resources Board. Laws and Regulations. Available at: http://www.arb.ca.gov/html/lawsregs.htm. Accessed November 2024.

California Air Resources Board. Low Carbon Fuel Standard Data Dashboard. Available at: https://www.arb.ca.gov/fuels/lcfs/dashboard/dashboard.htm. Accessed: December 2024.

board to be vehicles that are primarily used for non-commercial personal transportation in the State. The bill required that CARB set GHG emission standards for motor vehicles manufactured in 2009 and all subsequent model years. CARB adopted the standards in September 2004. When fully phased in, the near-term (2009–2012) standards would result in a reduction of approximately 22 percent of GHG emissions compared to the emissions from the 2002 fleet, and the mid-term (2013–2016) standards would result in a reduction of approximately 30 percent.

#### Renewable Portfolio Standard (RPS), Senate Bill 350, and Senate Bill 100

Established in 2002 under SB 1078, accelerated in 2006 under SB 107, and expanded in 2011 under SB 2, California's RPS is one of the most ambitious renewable energy standards in the country. The RPS program requires investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 33 percent of total procurement by 2020. Since the inception of the RPS program, the program has been extended and enhanced multiple times. In 2015, SB 350 extended the State's RPS program by requiring that publicly owned utilities procure 50 percent of their electricity from renewable energy sources by 2030. The requirements of SB 350 were expanded and intensified in 2018 through the adoption of SB 100, which mandated that all electricity generated within the State by publicly owned utilities be generated through carbon-free sources by 2045. In addition, SB 100 increased the previous renewable energy requirement for the year 2030 by 10 percent; thus, requiring that 60 percent of electricity generated by publicly owned utilities originate from renewable sources by the year 2030.

#### Executive Order S-3-05

Executive Order (EO) S-3-05 (June 2005) established California's GHG emissions reduction targets and laid out responsibilities among the State agencies for implementing the EO and for reporting on progress toward the targets. The EO established the following targets:

- By 2010, reduce GHG emissions to 2000 levels;
- By 2020, reduce GHG emissions to 1990 levels; and
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

EO S-3-05 also directed CalEPA to report biannually on progress made toward meeting the GHG targets and the impacts to California due to global warming, including impacts to water supply, public health, agriculture, the coastline, and forestry. The Climate Action Team was formed, which subsequently issues yearly GHG reduction report cards to track the progress of emission reduction strategies. Each report card documents the effectiveness of measures to reduce GHG in California, presents GHG emissions from State agencies' operations, and shows reductions that have occurred in the two years prior to publication.

#### Assembly Bill 32

In furtherance of the goals established in EO S-3-05, the Legislature enacted AB 32 (Núñez and Pavley). The bill is referred to as the California Global Warming Solutions Act of 2006 (September 27, 2006). AB 32 provided initial direction on creating a comprehensive, multi-year program to limit California's GHG emissions to 1990 levels by 2020 and initiate the transformations required to achieve the State's long-range climate objectives. AB 32 also required that the CARB prepare a "scoping plan" for achieving the maximum technologically feasible and cost-effective GHG emissions reductions by 2030. The CARB's Scoping Plan is described in further detail below.

#### Senate Bill 32 and Assembly Bill 197

Senate Bill (SB) 32 and AB 197 (enacted in 2016) are companion bills. SB 32 codified the 2030 emissions reduction goal of EO B-30-15 by requiring CARB to ensure that Statewide GHG emissions are reduced to 40 percent below 1990 levels by 2030. AB 197 established the Joint Legislative Committee on Climate Change Policies, consisting of at least three members of the Senate and three members of the Assembly, to provide ongoing oversight over implementation of the State's climate policies. AB 197 also added two members of the Legislature to the Board as non-voting members; requires CARB to make available and update (at least annually via the CARB's website) emissions data for GHGs, criteria air pollutants, and TACs from reporting facilities; and requires CARB to identify specific information for GHG emissions reduction measures when updating the Scoping Plan.

#### CARB's Climate Change Scoping Plan

One specific requirement of AB 32 is for CARB to prepare a scoping plan for achieving the maximum technologically feasible and cost-effective GHG emission reductions by 2020 (Health and Safety Code Section 38561[a]), and to update the Scoping Plan at least once every five years. In 2008, CARB approved the first Scoping Plan. The Scoping Plan included a mix of recommended strategies that combined direct regulations, market-based approaches, voluntary measures, policies, and other emission reduction programs calculated to meet the 2020 Statewide GHG emission limit and initiate the transformations needed to achieve the State's long-range climate objectives. The key elements of the Scoping Plan include the following:

- 1. Expanding and strengthening existing energy efficiency programs as well as building and appliance standards:
- 2. Achieving a Statewide renewable energy mix of 33 percent;
- 3. Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85 percent of California's GHG emissions;
- 4. Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;
- 5. Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard (LCFS) (17 CCR, Section 95480 et seq.); and
- 6. Creating targeted fees, including a public goods charge on water use, fees on high GWP gases, and a fee to fund the administrative costs of the State's long-term commitment to AB 32 implementation.

The Scoping Plan also identified local governments as essential partners in achieving California's goals to reduce GHG emissions because they have broad influence and, in some cases, exclusive authority over activities that contribute to significant direct and indirect GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations. Specifically, the Scoping Plan encouraged local governments to adopt a reduction goal for municipal operations and for community emissions to reduce GHGs by approximately 15 percent from 2008 levels by 2020. Many local governments developed community-scale local GHG reduction plans based on this Scoping Plan recommendation.

In 2014, CARB approved the first update to the Scoping Plan. The First Update to the Climate Change Scoping Plan: Building on the Framework (First Update) defined the State's GHG emission reduction priorities for the next five years and laid the groundwork to start the transition to the post-2020 goals set forth in EO S-3-05 and EO B-16-2012. The First Update concluded that California is on track to meet the 2020 target but recommended a 2030 mid-term GHG reduction target be established to ensure a continuation of action to reduce emissions. The First Update recommended a mix of technologies in key economic sectors to reduce emissions through 2050, including energy demand reduction through efficiency and activity changes; large-scale electrification of on-road vehicles, buildings, and industrial machinery; decarbonizing electricity and fuel supplies; and the rapid market penetration of efficient and clean energy technologies. As part of the First Update, CARB recalculated the State's 1990 emissions level using more recent GWPs identified by the IPCC, from 427 MMTCO<sub>2</sub>e to 431 MMTCO<sub>2</sub>e.

In 2015, as directed by EO B-30-15, CARB began working on an update to the Scoping Plan to incorporate the 2030 target of 40 percent below 1990 levels by 2030 to keep California on a trajectory toward meeting or exceeding the long-term goal of reducing GHG emissions to 80 percent below 1990 levels by 2050, as set forth in EO S-3-05. In summer 2016, the Legislature affirmed the importance of addressing climate change through passage of SB 32 (Pavley, Chapter 249, Statutes of 2016).

In December 2017, the Scoping Plan was once again updated. The 2017 Scoping Plan built upon the successful framework established in the initial Scoping Plan and First Update, while identifying new, technologically feasible and cost-effective strategies that would serve as the framework to achieve the 2030 GHG target as established by SB 32 and define the State's climate change priorities to 2030 and beyond. For local governments, the 2017 Scoping Plan replaced the initial Scoping Plan's 15 percent reduction goal with a recommendation to aim for a communitywide goal of no more than six MTCO<sub>2</sub>e per capita by 2030, and no more than two MTCO<sub>2</sub>e per capita by 2050, which are consistent with the State's long-term goals. The 2017 Scoping Plan recognized the benefits of local government GHG planning (e.g., through Climate Action Plans [CAPs]) and provided more information regarding tools to support those efforts. The 2017 Scoping Plan also recognized the CEQA streamlining provisions for project-level review where a legally adequate CAP exists.

When discussing project-level GHG emissions reduction actions and thresholds in the context of CEQA, the 2017 Scoping Plan stated that "achieving no net additional increase in GHG emissions, resulting in no contribution to GHG impacts, is an appropriate overall objective for new development" for project-level CEQA analysis, but also recognized that such a standard may not be appropriate or feasible for every development project. The 2017 Scoping Plan further provided that "the inability of a project to mitigate its GHG emissions to net zero does not imply the project results in a substantial contribution to the cumulatively significant environmental impact of climate change under CEQA."

The most recent update to the Scoping Plan, the 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan Update) was adopted by the CARB in December 2022. <sup>15</sup> The 2022 Scoping Plan Update builds upon previous efforts to reduce GHG emissions and is designed to continue to shift the California economy away from dependence on fossil fuels. The 2022 Scoping

<sup>&</sup>lt;sup>15</sup> California Air Resources Board. 2022 Scoping Plan for Achieving Carbon Neutrality. November 16, 2022.

Plan Update, the most comprehensive and far-reaching Scoping Plan developed to date, identifies a technologically feasible and cost-effective path to achieve carbon neutrality by 2045 while also assessing the progress California is making toward reducing its GHG emissions by at least 40 percent below 1990 levels by 2030, as called for in SB 32 and laid out in the 2017 Scoping Plan. The 2030 target is an interim but important stepping stone along the critical path to the broader goal of deep decarbonization by 2045. The relatively longer path assessed in the Scoping Plan incorporates, coordinates, and leverages many existing and ongoing efforts to reduce GHGs and air pollution, while identifying new clean technologies and energy.

The 2022 Scoping Plan Update lays out a path to achieve targets for carbon neutrality and reduce GHG emissions by 85 percent below 1990 levels by 2045, as directed by AB 1279. The actions and outcomes in the plan will achieve significant reductions in fossil fuel combustion by deploying clean technologies and fuels, further reductions in short-lived climate pollutants, support for sustainable development, increased action on NWL to reduce emissions and sequester carbon, and the capture and storage of carbon.

#### Executive Order S-1-07

EO S-1-07, otherwise known as the LCFS, was adopted in 2009 and requires transportation fuels such as gasoline and diesel sold within the state to be less carbon intensive. These policies reduce emissions from on-road transportation and off-road equipment use.

#### Senate Bill 375

SB 375 (Steinberg) (September 2008) addresses GHG emissions associated with the transportation sector through regional transportation and sustainability plans. SB 375 requires CARB to adopt regional GHG reduction targets for the automobile and light-truck sector for 2020 and 2035, and to update those targets every eight years. SB 375 requires the State's 18 regional metropolitan planning organizations to prepare a sustainable communities strategy as part of their Regional Transportation Plans that will achieve the GHG reduction targets set by CARB. If a metropolitan planning organization is unable to devise a sustainable communities strategy to achieve the GHG reduction target, the metropolitan planning organization must prepare an alternative planning strategy demonstrating how the GHG reduction target would be achieved through alternative development patterns, infrastructure, or additional transportation measures or policies.

Pursuant to California Government Code Section 65080(b)(2)(K), a sustainable communities strategy does not (1) regulate the use of land, (2) supersede the land use authority of cities and counties, or (3) require that a city's or county's land use policies and regulations, including those in a general plan, be consistent with the sustainable community strategy. Nonetheless, SB 375 makes regional and local planning agencies responsible for developing those strategies as part of the federally required metropolitan transportation planning process and the State-mandated housing element process.

#### Executive Order S-13-08

EO S-13-08 (November 2008) is intended to hasten California's response to the impacts of global climate change, particularly sea-level rise. Therefore, the EO directs State agencies to take specified actions to assess and plan for such impacts. The final 2009 California Climate Adaptation Strategy report was issued in December 2009, and an update, Safeguarding

California: Reducing Climate Risk, followed in July 2014. To assess the State's vulnerability, the report summarizes key climate change impacts to the State for the following areas: agriculture, biodiversity and habitat, emergency management, energy, forestry, ocean and coastal ecosystems and resources, public health, transportation, and water. Issuance of the Safeguarding California: Implementation Action Plans followed in March 2016. In January 2018, the CNRA released the Safeguarding California Plan: 2018 Update, which communicates current and needed actions that the State government should take to build climate change resiliency.

#### Assembly Bill 197

AB 197 established the Joint Legislative Committee on Climate Change Policies, consisting of at least three members of the Senate and three members of the Assembly, to provide ongoing oversight over implementation of the State's climate policies. AB 197 also added two members of the Legislature to the Board as non-voting members; requires CARB to make available and update (at least annually via the CARB's website) emissions data for GHGs, criteria air pollutants, and TACs from reporting facilities; and requires CARB to identify specific information for GHG emissions reduction measures when updating the Scoping Plan.

#### Executive Order B-55-18/Assembly Bill 1279

EO B-55-18 (September 2018) establishes a Statewide policy for California to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net-negative emissions thereafter. The goal is an addition to the existing Statewide targets of reducing the State's GHG emissions. CARB intends to work with relevant State agencies to ensure that future scoping plan updates identify and recommend measures to achieve the carbon neutrality goal. On September 16, 2022, AB 1279, also known as the California Climate Crisis Act, codified the carbon neutrality goal established by EO B-55-18.

#### Senate Bill 1383

SB 1383 establishes specific targets for the reduction of short-lived climate pollutants (SLCPs) (40 percent below 2013 levels by 2030 for CH<sub>4</sub> and HFCs, and 50 percent below 2013 levels by 2030 for anthropogenic black carbon), and provides direction for reductions from dairy and livestock operations and landfills. Accordingly, CARB adopted its SLCP Reduction Strategy in March 2017. The SLCP Reduction Strategy establishes a framework for the Statewide reduction of emissions of black carbon, CH<sub>4</sub>, and fluorinated gases.

#### Title 24, Part 6

Title 24 of the CCR, which is known as the California Building Standards Code (CBSC), was established in 1978 and serves to enhance and regulate California's building standards. While not initially promulgated to reduce GHG emissions, Part 6 of Title 24 specifically established Building Energy Efficiency Standards that are designed to ensure new and existing buildings in California achieve energy efficiency and preserve outdoor and indoor environmental quality. These energy efficiency standards are reviewed periodically, and revised if necessary, by the Building Standards Commission and CEC (PRC Section 25402[b][1]). The regulations receive input from members of industry, as well as the public, with the goal of "reducing of wasteful, uneconomic, inefficient, or unnecessary consumption of energy" (PRC Section 25402). The regulations are scrutinized and analyzed for technological and economic feasibility (PRC Section 25402[d]) and cost effectiveness (PRC Sections 25402[b][2] and [b][3]). As a result, the standards save energy, increase electricity supply reliability, increase indoor comfort, avoid the need to construct new power plants, and help preserve the environment.

The 2022 Title 24 standards are the currently applicable building energy efficiency standards and became effective on January 1, 2023. Compliance with the 2022 Title 24 Building Energy Efficiency Standards will reduce energy use and associated GHG emissions compared to structures built in compliance with the previous 2019 Title 24 standards.

#### Title 24, Part 11

In addition to the CEC's efforts, in 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (Part 11 of Title 24) is commonly referred to as CALGreen, and establishes minimum mandatory standards and voluntary standards pertaining to the planning and design of sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and interior air quality. The CALGreen standards took effect in January 2011 and instituted mandatory minimum environmental performance standards for all ground-up, new construction of commercial, low-rise residential and State-owned buildings and schools and hospitals. The original CALGreen standards have been updated several times. The CALGreen 2022 standards, which are the current standards, improved upon the 2019 CALGreen standards, and went into effect on January 1, 2023. The 2022 CALGreen Code focuses on four key areas in newly constructed homes and businesses: 16

- Encouraging electric heat pump technology for space and water heating, which consumes less energy and produces fewer emissions than gas-powered units.
- Establishing electric-ready requirements for single-family homes to position owners to use cleaner electric heating, cooking and electric vehicle (EV) charging options whenever they choose to adopt those technologies.
- Expanding solar PV system and battery storage standards to make clean energy available onsite and complement the state's progress toward a 100 percent clean electricity grid.
- Strengthening ventilation standards to improve indoor air quality.

The CALGreen standards also include voluntary efficiency measures that are provided at two tiers and implemented at the discretion of local agencies and applicants. According to Section A4.602 of Appendix A4 of the CALGreen Code, CALGreen's Tier 1 standards call for a 15 percent improvement in energy requirements, stricter water conservation, 65 percent diversion of construction and demolition waste, 10 percent recycled content in building materials, 20 percent permeable paving, 20 percent cement reduction, and cool/solar-reflective roofs. CALGreen's more rigorous Tier 2 standards call for a 30 percent improvement in energy requirements, stricter water conservation, 80 percent diversion of construction and demolition waste, 15 percent recycled content in building materials, 30 percent permeable paving, 25 percent cement reduction, and cool/solar-reflective roofs.

#### Title 20

Title 20 of the CCR requires manufacturers of appliances to meet State and federal standards for energy and water efficiency. The CEC certifies an appliance based on a manufacturer's

California Energy Commission. Energy Commission Adopts Updated Building Standards to Improve Efficiency, Reduce Emissions From Homes and Businesses. Available at: https://www.energy.ca.gov/news/2021-08/energy-commission-adopts-updated-building-standards-improve-efficiency-reduce-0. Accessed March 2024.

demonstration that the appliance meets the standards. New appliances regulated under Title 20 include refrigerators, refrigerator-freezers, and freezers; room air conditioners and room air-conditioning heat pumps; central air conditioners; spot air conditioners; vented gas space heaters; gas pool heaters; plumbing fittings and plumbing fixtures; fluorescent lamp ballasts; lamps; emergency lighting; traffic signal modules; dishwaters; clothes washers and dryers; cooking products; electric motors; low-voltage dry-type distribution transformers; power supplies; televisions and consumer audio and video equipment; and battery charger systems. Title 20 presents protocols for testing each type of appliance covered under the regulations, and appliances must meet the standards for energy performance, energy design, water performance, and water design. Title 20 contains three types of standards for appliances: federal and State standards for federally regulated appliances, State standards for federally regulated appliances, and State standards for non-federally regulated appliances.

#### Fleet Rule for Transit Agencies

On December 14, 2018, the CARB unanimously approved the Innovative Clean Transit regulation. The Innovative Clean Transit regulation requires transit agencies to begin transitioning existing fleets to zero-emission vehicles, and requires that future vehicle purchases be zero-emission vehicles. The result of the Innovative Clean Transit regulation will be that by 2040, all transit vehicles within California will be zero-emissions vehicles.

#### Advanced Clean Trucks Regulation

The Advanced Clean Trucks Regulation was approved in March 2021 and was codified in the California Code of Regulations. The Advanced Clean Trucks Regulation is a sales requirement for manufacturers ZEV production and requires that from 2024 to 2035 manufacturers are required to sell zero-emission trucks as an increasingly large percentage of their annual sales. Fleet owners are required to report about their existing fleet operations to aid in the transition of medium to heavy duty vehicles to be zero-emissions. The increasing percentage of required ZEV has support through funding programs and provides a greater variety of ZEV to consumers.

#### **Local Regulations**

The following are the regulatory agencies and regulations pertinent to the proposed project on a local level.

#### San Joaquin Valley Air Pollution Control District

Various local, regional, State and federal agencies share the responsibility for air quality management in the Central Valley. The San Joaquin Valley Air Pollution Control District (SJVAPCD) operates at the local level with primary responsibility for attaining and maintaining the federal and State Ambient Air Quality Standards (AAQS) in Fresno, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare counties, and portions of Kern County. The SJVAPCD is tasked with implementing programs and regulations required by the FCAA and the California Clean Air Act (CCAA), including preparing plans to attain federal and State AAQS. The SJVAPCD works jointly with the USEPA, CARB, SACOG, other air districts in the Central Valley region, county and city transportation and planning departments, and various non-governmental

organizations to improve air quality through a variety of programs. Programs include the adoption of regulations, policies and guidance, extensive education and public outreach programs, as well as emission reducing incentive programs.

Nearly all development projects in the Central Valley region have the potential to generate air pollutants and GHG emissions. Therefore, for most projects, evaluation of air quality and GHG emissions impacts is required to comply with CEQA. In order to help public agencies evaluate air quality impacts, the SJVAPCD has developed the *Guidance for Assessing and Mitigating Air Quality Impacts*. The SJVAPCD's guide includes recommended thresholds of significance, including mass emission thresholds for construction-related and operational GHG emissions as well as GHG emissions from stationary sources. Projects resulting in emissions in excess of the SJVAPCD's mass emissions thresholds are required to implement all feasible mitigation to reduce GHG emissions.

#### San Joaquin Council of Governments

Under SB 375, SJCOG adopted the 2022 RTP/SCS. 18 The RTP/SCS applies the goals of SB 375 and is intended to reduce GHG emissions through coordination between transportation and land use planning. One of the key goals of the RTP/SCS, is the reduction of GHG emissions from passenger vehicles. To accomplish such reductions, the RTP/SCS seeks to improve connections between the housing stock and employment centers within the planning area through compact and mixed-use developments. Should development within the SJCOG region advance in a manner consistent with the RTP/SCS forecasts, SJCOG anticipates that the region would meet the GHG emissions reductions goals for the region while simultaneously reducing the emissions of certain criteria pollutants. Additionally, SJCOG uses the RTP/SCS as a means of prioritizing infrastructure investment within SJCOG's jurisdictions. Investment in infrastructure is split between large regional projects, such as highway interchange improvements and high occupancy vehicle lanes, as well as focused local projects such as investments in bicycle, pedestrian, and transit infrastructure.

#### Regional Transportation Plan/Sustainable Communities Strategy Update

The Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) is on a four-year update and adoption cycle. Consequently, SJCOG has prepared various staff reports, research documents, and draft preferred scenarios as part of the process of preparing the 2022 RTP/SCS. On December 24, 2020, SJCOG released a Notice of Preparation notifying the public that an Environmental Impact Report would be prepared to analyze potential impacts from implementation of the 2022 MTP/SCS. Following the environmental review, the 2022 RTP/SCS was subsequently adopted on August 25, 2022.

#### <u>City of Manteca General Plan</u>

The City's General Plan includes the following applicable goals, performance objectives, and policies related to air quality, GHG emissions, and energy.

<sup>17</sup> San Joaquin Valley Air Quality Management District. Guidance for Assessing and Mitigating Air Quality Impacts. Adopted March 2015.

San Joaquin Council of Governments. 2022 Regional Transportation Plan and Sustainable Communities Strategy. August 25, 2022.

### **Resource Conservation Chapter**

Goal RC-4

Improve climate resiliency through reducing greenhouse gas emissions through sustainable energy, transportation, land use, and local governments actions that maximize energy efficiency and reduce energy usage and greenhouse gas emissions.

Policy RC-4.1

Support the conservation of energy through comprehensive and sustainable land use transportation, and energy planning, implementation greenhouse gas reduction measures, and inclusive public education and outreach regarding climate adaptation and greenhouse gas emissions to address opportunities to decrease emissions associated with growth, development, and local government operations.

Policy RC-4.2

Support and actively participate with the state, regional, and local agencies and stakeholders toward State greenhouse gas emission reduction goals.

Policy RC-4.3

Maintain an updated Climate Action Plan that addresses State adopted GHG reduction goals and provides effective measures to meet GHG targets.

Policy RC-4.4

Ensure that land use and circulation improvements are coordinated to reduce the number and length of vehicle trips.

Policy RC-4.5

Require private development to incorporate non-traditional nonpolluting renewable energy sources such as co-generation, wind, and solar, where feasible, to reduce dependence on fossil fuels and meet climate goals.

Policy RC-4.6

Require all new public and privately constructed buildings to exceed, where feasible, and comply with construction and design standards that promote energy conservation, including the most current "green" development standards in the California Green Building Standards Code.

Policy RC-4.7

Require expanded innovative and green building best practices, where feasible, including, but not limited to, LEED certification for all new development and retrofitting existing uses, and encourage public and private projects to exceed the most current "green" development standards in the California Green Building Standards Code.

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Policy RC-4.8	Increase energy efficiency and conservation in public buildings and infrastructure.
Policy RC-4.9	Encourage the conservation of public utilities and use of renewable energy technologies in new development, rehabilitation projects, and in City buildings and facilities.
Policy RC-4.10	Encourage measures, including building siting and shading and use of shade trees, to reduce urban heat island effects
Policy RC-4.11	Support state efforts to power electricity with renewable and zero-carbon resources, such as solar and wind energy.
Policy RC-4.12	Encourage the conservation of petroleum products.
Policy RC-4.13	Encourage the installation of renewable energy technologies serving agricultural operations.

# 4. REGIONAL IMPACTS OF CLIMATE **CHANGE**

# 4. REGIONAL IMPACTS OF CLIMATE CHANGE

The following chapter will discuss the potential environmental impacts, such as temperature, precipitation, and wildfires, of climate change on the City of Manteca and surrounding areas. Additionally, specific local effects such as water supply, local agriculture, and public health are discussed beneath.

### 4.1 INTRODUCTION TO REGIONAL IMPACTS AND EFFECTS

Executive Order (EO) S-13-08 directed the Natural Resources Agency to prepare a climate adaptation strategy identifying the potential risks to California posed by climate change. <sup>16</sup> The initial climate adaptation strategy was prepared in 2009, with updates published in 2014 and 2018. The 2018 publication from the Natural Resources Agency titled Safeguarding California Plan: 2018 Update, known as the Safeguarding California Plan, <sup>17</sup> is the most recently published climate adaptation strategy for California.

The Safeguarding California Plan focuses on the increasingly visible effects of climate change, with specific focus on how climate change is currently impacting, and will continue to impact, some of California's most valuable assets. In addition to the Safeguarding California Plan, the State of California invests in scientific research related to the changing climate and identifies vulnerabilities and actions to reduce the resulting impacts to people and infrastructure. The most current information is documented in *California's Fourth Climate Change Assessment* (4<sup>th</sup> Assessment), <sup>18</sup> which contains reports for nine geographic regions of the State, including the San Joaquin Valley, <sup>19</sup> in which the City of Manteca is located. A companion to the 4<sup>th</sup> Assessment, the Cal-Adapt Snapshot Tool, <sup>20</sup> provides a platform for agencies to extract local data, which can be used to inform policy and program decisions. The potential impacts from the Local Climate Change Snapshot for Manteca (Manteca Snapshot) are summarized within this chapter. The full report is included as Attachment C to this CAP Update.

While many of the climate change impacts identified in the Safeguarding California Plan and the 4th Assessment occur on a Statewide or global scale, this section of the CAP Update will focus

State of California, Office of Governor Arnold Schwarzenegger. Executive Order S-3-08. November 2008.

<sup>17</sup> State of California, Natural Resources Agency. Safeguarding California Plan: 2018 Update. January 2018.

State of California Governor's Office of Planning and Research, State of California Energy Commission, and California Natural Resources Agency. Available at: https://www.energy.ca.gov/sites/default/files/2019-11/Statewide\_Reports-SUM-CCCA4-2018-013\_Statewide\_Summary\_Report\_ADA.pdf. Accessed September 2023

State of California Governor's Office of Planning and Research, State of California Energy Commission, and California Natural Resources Agency. California's Fourth Climate Change Assessment, San Joaquin Valley Region Report. Available at: https://www.energy.ca.gov/sites/default/files/2022-01/CA4\_CCA\_SJ\_Region\_Eng\_ada.pdf. Accessed September 2023.

<sup>20</sup> Cal-Adapt. Local Climate Change Snapshot Tool. Available at: https://cal-adapt.org/tools/local-climate-change-snapshot. Accessed August 2023.

on those impacts that could directly impact Manteca. Based on the Safeguarding California Plan, 4<sup>th</sup> Assessment, and Manteca Snapshot, global climate change may impact the following local conditions: temperature increases, precipitation changes, and wildfires.

### **Temperature Increases**

Temperature is analyzed in multiple ways for climate impacts: annual average maximums, extreme heat days, warm nights, and annual average minimums.

The Manteca Snapshot reports that California expects increases in temperature in the twenty-first century. For Manteca specifically, the annual average maximum temperature is 74.4 degrees Fahrenheit (observed over 30 years) and by mid-century (2035-2064) is expected to increase 3.8 degrees to 78.2 degrees Fahrenheit under the Representative Concentration Pathway (RCP) 4.5, which is described by the Intergovernmental Panel on Climate Change as a moderate scenario in which GHG emissions peak around 2040 and then decline. Another scenario, RCP 8.5, is the highest baseline GHG emissions scenario in which emissions continue to rise throughout the twenty-first century without declining. For the RCP 8.5 scenario, the annual average maximum temperature is expected to increase 4.7 degrees to 79.1 degrees Fahrenheit by mid-century.

Extreme heat days are defined as days with temperatures greater than the threshold temperature, which is the 98<sup>th</sup> percentile value of the historical daily maximum temperatures from 1961-1990, between April and October. The historical number of extreme heat days for Manteca is four days each year (observed over 30 years), and by mid-century (2035-2064) is expected to increase by 11 days under the RCP 4.5 scenario and 16 days under the RCP 8.5 scenario.

The annual average minimum temperature in Manteca is 48.1 degrees Fahrenheit (observed over 30 years), and by mid-century (2035-2064) is expected to increase 3.3 degrees to 51.3 degrees Fahrenheit under the RCP 4.5 scenario. For the RCP 8.5 scenario, the annual average minimum temperature is expected to increase 4.2 degrees to 52.2 degrees Fahrenheit.

Warm nights are considered when daily minimum temperatures are above a threshold temperature. The default warm night threshold temperature is the 98<sup>th</sup> percentile of historical overnight minimum temperatures from 1961-1990, between April and October. The historical number of warm nights for Manteca is four nights each year (observed over 30 years), and by mid-century (2035-2064) is expected to increase by 12 nights under the RCP 4.5 scenario and 19 nights under the RCP 8.5 scenario.

Temperature changes within the City of Manteca could impact:

- Irrigation requirements for businesses, residences, and City facilities (i.e., parks);
- Agricultural production;
- Biodiversity in parks, open spaces, and agricultural lands;
- Energy and expenditures required to keep businesses, residences, and City facilities cool;
- Demand on emergency services to respond to heat-related health incidences; and
- Exposure to potential increases in air pollution.

### **Precipitation Changes**

Precipitation is analyzed in a few different ways for climate impacts: maximum single-day precipitation; maximum length of dry spell; and annual precipitation.

The Manteca Snapshot reports that the dry years will become drier and wet years will become wetter. Dry years could occur consecutively, creating drought conditions. Storms will become more intense but have shorter wet seasons. For Manteca, the maximum single-day precipitation is 1.093 inches (observed over 30 years), and by mid-century (2035-2064) is expected to increase by 0.05 inches under the RCP 4.5 scenario and 0.064 inches under the RCP 8.5 scenario.

Maximum length of dry spell is the maximum number of consecutive days each year with precipitation less than one millimeter. For Manteca, the maximum length of dry spell observed over 30 years is 125 days, and by mid-century (2035-2064) is expected to increase by six days under the RCP 4.5 scenario and seven days under the RCP 8.5 scenario.

Lastly, precipitation is measured by annual inches. Manteca's annual precipitation observed over 30 years is 12.1 inches, and by mid-century (2035-2064) is expected to decrease by 0.2 inches under the RCP 4.5 scenario. The RCP 8.5 scenario would not result in a change.

Precipitation changes within the City of Manteca could impact:

- Availability of surface water and groundwater for potable sources;
- Irrigation requirements for businesses, residences, and City facilities;
- Agricultural production;
- Flooding; and
- Drought.

# **Wildfires**

Wildfires in California have been more severe and frequent in part as a result of the changing climactic conditions. Although wildfires are not expected to occur within the City limits, the consequences of wildfires are still experienced in Manteca. Wildfires in surrounding areas could lead to the following impacts within the City of Manteca:

- Increase in public health impacts such as asthma and other respiratory ailments due to exposure to air pollution;
- Cancellation of sporting events and school physical education classes; and
- Increased demand for medical services and fire protection services.

# 4.2 <u>EFFECTS OF CLIMATE CHANGE WITHIN MANTECA</u>

The foregoing changes are expected to directly influence the residents, employees, and visitors of Manteca. Specific regional effects related to widescale changes in temperature, precipitation, and wildfire are discussed in further detail below.

### **Effects on Water Resources**

Water is of crucial importance to all facets of everyday life. Potential effects on water supply due to changes in precipitation frequency and timing (from both rainfall and snowmelt) due to climate change could be a future threat to supply. Although uncertainty exists regarding the specific

outcomes of climate change on precipitation patterns within the State, scientists agree that climate change will alter the hydrologic patterns. In particular, climate change is anticipated to affect the frequency, magnitude, and duration of extreme weather events, and result in declining snowpack, as well as more frequent and longer droughts.<sup>21</sup> Furthermore, an increased proportion of winter precipitation is anticipated to fall as rain, rather than snow, and the snow that does accumulate is anticipated to melt earlier in the year. The combined effect of less overall snowfall and earlier melting will be a change in the timing and volume of snowmelt, which will alter streamflow. Such changes to precipitation regimes could also result in reduced or irregular groundwater recharge within the watershed.

Manteca's water supply consists of both surface water and groundwater. The City of Manteca requires potable water for sinks, toilets, and drinking fountains in its buildings, and water for irrigating landscaped areas, including parks and sports fields, trails, landscape corridors, roadway medians, and more. The 2020 Urban Water Management Plan<sup>22</sup> indicates Manteca purchases treated surface water from South San Joaquin Irrigation District (SSJID) conveyed from the Stanislaus River, and groundwater pumped by the City from City-owned and operated wells. The City also uses irrigation wells for non-potable water demands such as landscaping, and recycled water from the City's Wastewater Quality Control Facility. Considering the link between precipitation, surface water, and groundwater, future supply is dependent on climactic trends and precipitation patterns within the San Joaquin Valley Basin, Eastern San Joaquin Subbasin, and the State.

In addition to altering surface water and groundwater, changes in precipitation patterns could affect the risk of flooding within the City. Extreme weather events such as heavy precipitation events can stress existing flood control infrastructure resulting in both localized and regional flooding. Localized flooding could result from stormwater drainage systems being overwhelmed by extreme rainfall events, and can result in routine disruptions to City life, as streets, businesses, and/or homes can be damaged. Regional flooding issues can be caused when stormwater overwhelms larger infrastructure such as levees or dams. Major regional flood control infrastructure within California was designed based on historic precipitation patterns within the State. Climate change induced changes to precipitation patterns within the State could pose threats to such infrastructure. For instance, when rain falls on previously accumulated snow, the runoff from such precipitation events can overwhelm the storage capacity of dams requiring large amounts of water discharge. High discharge rates can lead to levee overtopping or degradation and rivers overtopping natural banks.<sup>23</sup> Regional flooding poses a risk to many communities within California, including the City of Manteca.

As temperatures change (including extreme heat events, higher minimum and maximum temperatures, etc.) in the northern San Joaquin Valley, a higher volume of water would be required to sustain healthy vegetation in landscaped areas and parks. During future droughts, the

State of California, Natural Resources Agency. Safeguarding California Plan: 2018 Update. January 2018.

City of Manteca. June 2023. 2020 Urban Water Management Plan. Available at: <a href="https://www.manteca.gov/home/showpublisheddocument/5814/638236309616300000">https://www.manteca.gov/home/showpublisheddocument/5814/638236309616300000</a>. Accessed September 8, 2023.

<sup>23</sup> State of California Department of Justice. Climate Change Impacts in California. Available at: https://oaq.ca.gov/environment/impact. Accessed September 25, 2023.

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ground water level in the Eastern San Joaquin Subbasin could deepen and surface waters from the Stanislaus River could be reduced, which could lead to increase costs of water collection. The increased demand for water compounded with decreased water availability could present a challenge for the City and require reductions in water usage.

A decrease in water availability for agriculture due to temperature and precipitation changes may lead to a reduction in crop production. Temperature and precipitation change also directly effect agriculture production by reducing chill hours for crops, and decreasing photosynthesis and pollination, among other biological impacts. A decrease in tule fog may reduce the dormancy that some fruit and nut trees require. Carbon dioxide concentrations also may directly affect nitrogen fixation, water use efficiency, and yield production.<sup>24</sup>

The changes in water resources, temperature, precipitation, and agriculture may impact biodiversity in the open spaces, parks, and areas surrounding Manteca. Biodiversity refers to the variety of living things in an ecosystem, including plants, animals, microbes, habitats, and even genetic diversity within a species. A diverse ecosystem is considered to be a robust and resilient ecosystem. Genetic diversity allows organisms to adapt to their environment as the environment changes or new diseases come into play. Climate change can cause a decline in biodiversity by altering the availability of water and nutrient resources, creating an environment suitable for new plant and animal diseases, and leading to a decrease in the overall resilience of ecosystems. A warming earth can also cause plants to flower earlier in the year and shift the timing of bird migration, which can subsequently affect other inter-related natural processes. In addition, humans often depend on biodiversity in local parklands and open space areas for spirituality, inspiration, aesthetic enjoyment, and recreation. Humans benefit from the ecosystem services provided by biodiverse habitats, which include nutrient cycling, pollination, air purification, stormwater control, and others.<sup>25, 26</sup>

### **Effects on Public Health**

Climate change poses multiple threats to public health, including risks related to extreme heat events, wildfire smoke, and declining air quality. Increases in average and maximum air temperatures would contribute to increased risk of dehydration, heat exhaustion, heat stroke, and other heat-related illnesses throughout the City of Manteca.

In addition to the direct physical effects that can occur due to excessive heat exposure, higher temperatures have the potential to degrade air quality, which can affect the respiratory health of residents. Higher temperatures increase the formation of unhealthy air pollutants such as ozone and particulate matter; thus, while the emission of pollutants may remain constant, the quality of

- State of California Governor's Office of Planning and Research, State of California Energy Commission, and California Natural Resources Agency. 2022. California's Fourth Climate Change Assessment, San Joaquin Valley Region Report. Pages 47-52. Available at: <a href="https://www.energy.ca.gov/sites/default/files/2022-01/CA4">https://www.energy.ca.gov/sites/default/files/2022-01/CA4</a> CCA SJ Region Eng ada.pdf. Accessed September 5, 2023.
- United Nations Environment Programme. Global Environment Outlook GEO4 Environment for Development. 2007. Available <a href="https://wedocs.unep.org/handle/20.500.11822/7646;jsessionid=E5E3FA788FF9552735D898F9D76359BE">https://wedocs.unep.org/handle/20.500.11822/7646;jsessionid=E5E3FA788FF9552735D898F9D76359BE</a>. Accessed September 25, 2023.
- Center for Health and the Global Environment at Harvard Medical School. *Biodiversity: Its Importance to Human Health*. 2002. Available at: <a href="http://www.dcnanature.org/wp-content/uploads/fundraising/Biodiversity-Importance-to-Human-Health.pdf">http://www.dcnanature.org/wp-content/uploads/fundraising/Biodiversity-Importance-to-Human-Health.pdf</a>. Accessed September 25, 2023.

the air is still degraded due to the increased formation of harmful air pollutants. Ozone and particulate matter contribute to a variety of health problems such as asthma, acute respiratory diseases, cardiovascular diseases, and decreased lung capacity.<sup>27</sup>

Groups vulnerable to the negative health effects of poor air quality include infants, the elderly, and people working or recreating outdoors. Young athletes may prove to be especially vulnerable, as young adults typically perceive themselves to be healthier and more resilient, and because negative effects of poor air quality may not express themselves immediately, athletes may wrongly assume that poor air quality is not affecting their health. In reality, effects of poor air quality can increase with long-term exposure, and may not manifest immediately upon initial exposure. Consequently, any resident that works, recreates, or spends any substantial amount of time outside would be impacted by decreased air quality. Although these various pollutants are not addressed as part of this CAP Update, the pollutants are continually regulated by the SJVAPCD.

Although the City does not have an increased threat of wildfires due to its urban nature, increases in wildfires in the State have a negative effect on air quality, and can emit substantial amounts of volatile organic compounds, as well as particulate matter. Youth sporting events, including practices, and other outdoor events could be cancelled or postponed in the event of poor air quality days due to fire. Outdoor workers are similarly exposed, but due to economics, outdoor work is not generally cancelled or delayed due to poor air quality. Decreased air quality most severely impacts individuals with existing respiratory ailments, such as asthma, and can result in increased demand for emergency health services.

### **Conclusion of Local Effects**

Many members of the community rely on agriculture and related services for economic productivity, and the municipality of Manteca is tasked with protecting the health and prosperity of the residences of the community and its employees and visitors. Considering the potential effects of climate change on water resources, agriculture, and public health, the State has enacted various laws in an attempt to curb such impacts of climate change. Laws including AB 32, SB 97, SB 375, SB 32, and SB 743 establish Statewide efforts to reduce GHG emissions in order to avoid the anticipated effects of climate change. In an effort to work towards implementing the foregoing State laws and various executive orders, and achieving State climate goals, the City of Manteca is doing its part to protect environmental health, human safety, and prosperity within the region. Such actions, taken on a community level, will work in concert with the actions taken by the County, SJVAPD, SJCOG, the State, and the federal government, to reduce the impacts and threat of climate change.

<sup>&</sup>lt;sup>27</sup> California Air Resources Board. *Common Air Pollutants*. Available at: <a href="https://ww2.arb.ca.gov/resources/common-air-pollutants">https://ww2.arb.ca.gov/resources/common-air-pollutants</a>. Accessed September 11, 2023.

# 5. EMISSIONS QUANTIFICATION

# 5. EMISSIONS QUANTIFICATIONS

The following chapter will provide an overview of the planning background, target setting, inventories, and methodology for emissions quantifications used in the CAP Update.

### 5.1 PLANNING BACKGROUND AND TARGET SETTING

The City of Manteca's City Council appointed members of the Manteca Climate Action Plan Advisory Committee (CAPAC) in 2023 to advise during the CAP Update process. The CAPAC met regularly over the course of late 2023 and 2024 to set GHG reduction goals, discuss public outreach, the feasibility of goals, and reduction strategies. Over this period of planning the CAPAC set emission reduction targets to 6 MTCO2e per capita by 2030 and carbon neutrality by 2045, which are consistent with the State's targets.

California's GHG emissions reduction goals, as discussed in the Regulatory Setting section of this CAP Update, were established by various executive orders and legislated in AB 32 and SB 32. <sup>28</sup> The *California's 2022 Climate Change Scoping Plan*, adopted by the CARB on December 15, 2022, updated State objectives to reduce anthropogenic emissions by 40 percent below 1990 levels and aiming to achieve carbon neutrality by 2045.<sup>29</sup> The CAPAC's 6 MTCO2e per capita target is consistent with the 2022 Scoping Plan Update. Additionally, the target of carbon neutrality is in line with State goals, as legislated in EO B-55-18 and recommended in the 2022 Scoping Plan Update.

### 5.2 QUANTIFYING THE CAP UPDATE GHG INVENTORY

The following sections summarize efforts to quantify and inventory the City of Manteca's GHG emissions in 2020, as well as the forecasted GHG emissions for 2030 and 2045. The four key concepts relating to inventories and forecasts are as follows:

- Baseline Inventory. The baseline inventory is typically the most recent year with complete data for citywide emissions. The inventory acts as the basis for the creation of emission forecasts.
- Business-as-Usual Forecast. In order to illustrate the benefits and effectiveness of the state and local regulations, business-as-usual depicts emissions without restrictions or control. The inventories aid in depicting the magnitude of the issues if action is not taken.
- Statewide Adjusted Forecast. Emission reductions through the implantation of State programs, regulations, and policies. State requirements are applied to the business-asusual forecasts to identify the reductions remaining needed through local measures to remain consistent with AB 32 and SB 32.

California Air Resources Board. Achieving Carbon Neutrality in California. October 2020.

<sup>&</sup>lt;sup>29</sup> California Air Resources Board. 2022 Scoping Plan for Achieving Carbon Neutrality. December 2022.

• CAP Update Forecast. The CAP Update forecast demonstrates the final emissions after applying local goals and measures to the remaining emissions. The forecast illustrates the effectiveness of the CAP Update measures in reaching the intended targets.

Emissions were estimated and calculated using the International Council for Local Environmental Initiatives (ICLEI) recommended methodologies. The following sections of this chapter present the methodology used to calculate emissions. To estimate future emissions within the City, emissions from operations and activities within the City were first inventoried and emissions quantified. Following the inventory of existing Citywide emissions in 2020, growth estimated based on population projections were used to estimate future emissions levels. The 2020 inventory was created for the CAP Update to act as a baseline update to the previous 2005 and 2010 CAP inventories.

### **Previous GHG Emissions Quantifications**

Based on the 2013 CAP inventories for 2005 and 2010, Figure 9, shows emissions from on-road transportation, such as passenger automobiles, heavy duty trucks and service vehicles constitute the largest sector of emissions within the City. Residential, commercial, and industrial developments within the City consume energy in the form of electricity and natural gas. Although the majority of electricity, and all of the natural gas, consumed within the City of Manteca is not produced within the City limits, because such resources are consumed within the City, the emissions related to the production of electricity and the burning of natural gas are attributed to the City of Manteca. Residential, commercial, and industrial electricity consumption as well as natural gas use represent the second and third largest sources of emissions, respectively. Solid waste emissions represent the smallest portion in both inventories.

Solid Waste 42,308 30,464 GHG EMISSIONS (MTCO2E) 98,798 ■ Residential Energy 107,814 38,413 47,351 ■ Commerical Energy 42,308 26,735 ■ Process & Fugitive **Emissions** 213,432 210,373 ■ Transportation & Mobile Sources 2005 2010

Figure 9
City of Manteca 2005 and 2010 GHG Inventories (MTCO₂e)

Sources: City of Manteca 2005 Government Operations Greenhouse Gas Inventory, 2013. City of Manteca 2010 Government Operations Greenhouse Gas Inventory, 2013.

# **2020 Municipal Inventory**

Table 2 City of Manteca 2020 Baseline Government Operations					
Government Sector Metric Tons (CO2e) Percent of Sector Emissions					
Buildings & Facilities	786	12.5%			
Vehicle Fleet	2,705	43.3%			
Employee Commute	792	12.6%			
Solid Waste Facilities	202	3.2%			
Water & Wastewater Treatment Facilities	1,304	20.8%			
Street Lights & Traffic Signals	144	2.3%			
Transit Fleet	332	5.3%			
Total 6,265 100%					

The City of Manteca's Municipal operations total emissions of 6,265 MTCO₂e the 2020 baseline inventory as shown in Table 2. The majority of emissions originated from the vehicle fleet sector and water & wastewater treatment facilities sector, which combined accrue over 64 percent of the total 2020 emissions.

### **2020 Community Inventory**

Baseline local community emissions are presented in Table 3 below. The City of Manteca's Community emissions largely differ from municipal operations in the difference of sector percentages. The Transportation & Mobile Sources Sector constitutes 72 percent of the community baseline, with the rest of the sectors' percentages falling between five percent to nine percent.

Table 3 City of Manteca 2020 Baseline Community Emissions				
Community Sector Metric Tons (CO2e) Percent of Sector Emissions				
Residential Energy	65,272	9%		
Commercial Energy	33,715	5%		
Transportation & Mobile Sources	523,215	72%		
Solid Waste	56,157	8%		
Process & Fugitive Emissions	45,578	6%		
Total 723,937 100%				
CO2e = carbon dioxide equivalents ICLEI City of Manteca. 2020 Manteca Community Baseline. June 2023				

### 5.3 MANTECA GHG EMISSIONS FORECASTS

The City's 2043 General Plan established a vision for growth within the City's Planning area. Using the City's adopted General Plan in combination with the current and anticipated regional economic conditions, the San Joaquin Council of Governments (SJCOG) has produced growth estimates for the number of households that will be developed within the City of Manteca. Based on growth projections estimates for the number of households within the City by the year 2045, the City of Manteca's population is anticipated to increase to 165,301 residents, which would be an increase of 81,803 residents from 2020 population levels.

Rapid growth of residential and employment type development within the City of Manteca will increase GHG emitting activities such as the use of fossil fueled vehicles, the consumption of electricity, the consumption of water, the generation and treatment of wastewater, and the disposal of solid waste. Additionally, as the City of Manteca's residential, commercial, and industrial sectors grow, the size and activity of the municipal government is anticipated to grow as well. Such growth in the municipal government is anticipated to include increased electricity consumption related to new or expanded government facilities, installation and operation of new streetlights, expansion of the City's vehicle fleet, and increased wastewater treatment volumes at the City's wastewater treatment plant.

Based on the growth anticipated within the City of Manteca for the community and municipal government, future emissions within the City were estimated for the years 2030 and 2045. It should be noted that Statewide actions are anticipated to lower emissions from common sources such as electricity generation and vehicle use. Such Statewide actions include, but are not limited to, the RPS program that reduces the carbon intensity of electricity generations, programs related to AB 1007, which include the LCFS to reduce the carbon intensity of transportation fuels and promote alternatively fueled vehicles. To illustrate the efficacy of such Statewide actions, two separate emissions forecasts have been prepared for the years 2030 and 2045. The first emissions forecast, hereinafter referred to as the Business As Usual (BAU) forecast scenario, does not include any Statewide actions that may reduce GHG emissions. Thus, the BAU forecasts present a worst-case emissions scenario predicting the emissions that could occur, under the growth scenarios discussed above, should the City of Manteca and State fail to act sufficiently to control future GHG emissions.

However, as previously stated, Statewide emissions reductions strategies are in place related to electricity generation and demand, transportation, and various other emissions sources, and such strategies will work to reduce GHG emissions from activities within the City of Manteca. Therefore, a second emissions forecasting scenario has been prepared that depicts Citywide emissions that would occur in the absence of specific City policies to reduce GHG emissions, but with implementation of Statewide programs that would work to reduce emissions from activities in the City. The emissions forecast presented under the second scenario is considered more likely to occur because Statewide programs have been legislated and are currently being enacted, but the worst-case emissions forecast provided by the BAU forecast scenario is useful for analysis purposes and required for qualified CAPs.

### **Business-as-Usual Forecast**

In the absence of Statewide emissions reductions programs and City adoption of this CAP Update, Citywide emissions are anticipated to grow in proportion to the population growth within the City. The City of Manteca Business as Usual scenario emissions are shown in Table 4 and Table 5. The anticipated growth in emissions is presented below in Figure 10 through Figure 12.

The emissions forecasts presented in Figure 10 through Figure 12 are broken down between those emissions originating from activities in the larger community, such as emissions from residential energy use, and emissions resulting from municipal government operations, such as emissions from the City of Manteca's vehicle fleet.

Table 4				
	City of Manteca Business-as-Usual Government Forecast			
Year	20	30	204	+5
Government Sector	Metric Tons (CO2e)	Percent of Sector Emissions	Metric Tons (CO2e)	Percent of Sector Emissions
Buildings & Facilities	857	14%	1,207	15%
Vehicle Fleet	2,485	41%	3115	38%
Employee Commute	728	12%	913	11%
Solid Waste Facilities	236	4%	332	4%
Water & Wastewater Treatment Facilities	1,310	22%	1989	25%
Street Lights & Traffic Signals	109	2%	153	2%
Transit Fleet	322	5%	414	5%
Total	6,047	100%	8,123	100%
CO2e = carbon dioxide equivalents ICLEI City of Manteca. 2045 Government Operations Forecast. April 2025				

Table 5 City of Manteca Business-as-Usual Community Forecast				
Year	20	30	204	<del>1</del> 5
Community Sector	Metric Tons (CO2e)  Percent of Sector Emissions		Metric Tons (CO2e)	Percent of Sector Emissions
Residential Energy	79,992	10%	121,441	11%
Commercial Energy	38,983	5%	59,182	5%
Transportation & Mobile Sources	539,526	68%	733,527	66%
Solid Waste	74,179	9%	112,616	10%
Process & Fugitive Emissions	60,205	8%	91,401	8%
Total	792,885	100%	1,118,167	100%
CO2e = carbon dioxide equivalents ICLEI City of Manteca. 2045 Community Forecast. April 2025				

Figure 10
City of Manteca Community BAU Emissions Forecast

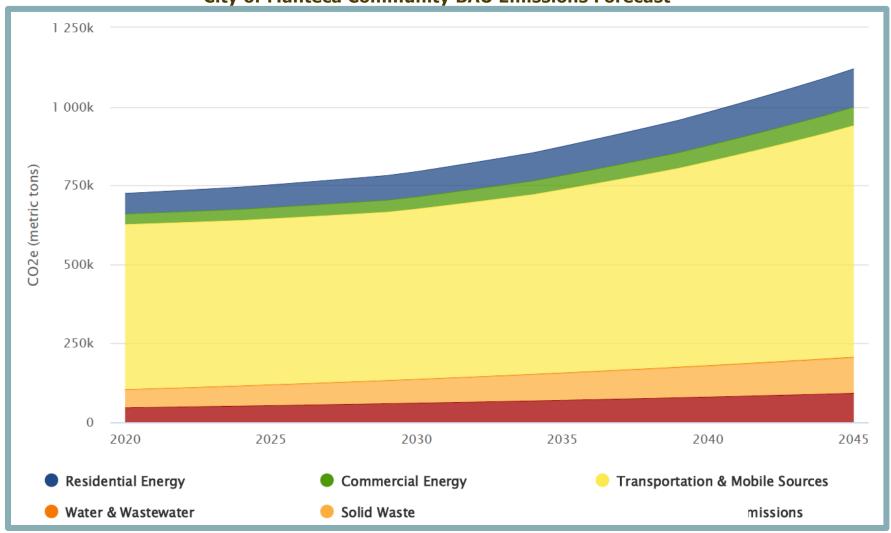


Figure 11
City of Manteca Municipal BAU Emissions Forecast

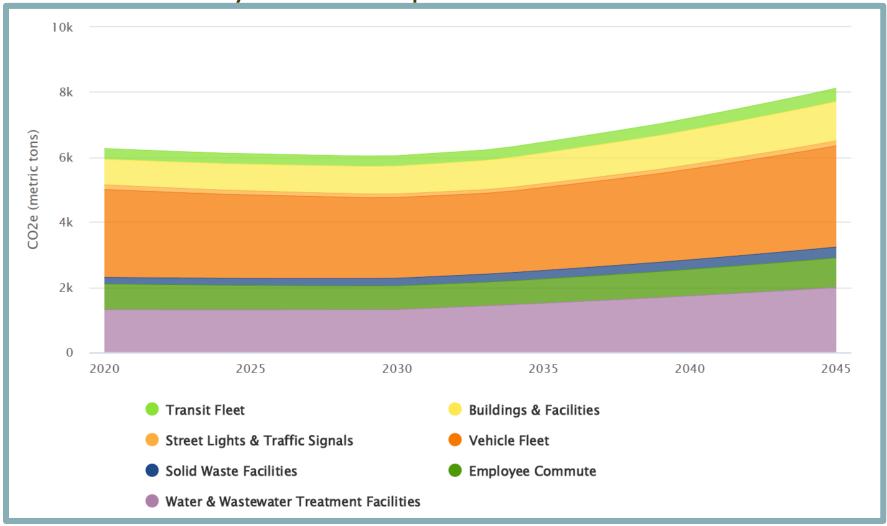
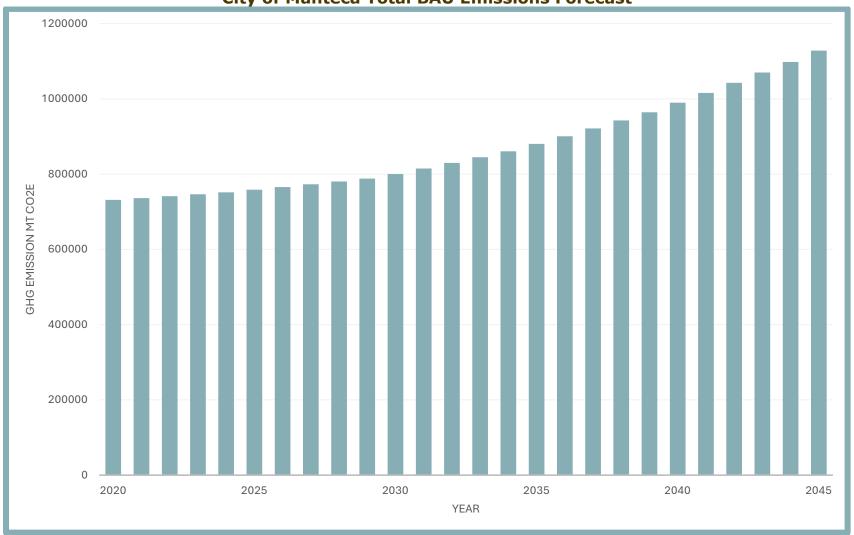


Figure 12 City of Manteca Total BAU Emissions Forecast



### **EXHIBIT A**

Under the assumption that neither the City's CAP Update nor Statewide emissions reductions policies were to be implemented, as shown in Table 6, the communitywide GHG emissions would rise from the inventoried level of 730,202 MTCO<sub>2</sub>e per year to 798,932 MTCO<sub>2</sub>e per year by 2030 and 1,126,290 MTCO<sub>2</sub>e by the year 2045.

Table 6 Comparison of Community Business-as-Usual Forecasts			
	2020	2030	2045
Population	83,498	114,934	165,302
Total Community Emissions	730,202	798,932	1,126,290
Per Capita Emissions Rate 8.75 6.95 6.81			
Exceeds Emissions Targets? YES YES YES			
Sources: Population Forecast for Manteca. November 2024; Clearpath, 2025.			

The foregoing increases in total GHG emissions would occur in concert with, and in large part because of, concurrent growth in the population of the City of Manteca. Therefore, despite the total increase in GHG emissions, per capita emissions rates would fall from 8.75 MTCO<sub>2</sub>e/yr/capita in 2020 to 6.95 MTCO<sub>2</sub>e/yr/capita in 2030 and finally lowering to 6.81 MTCO<sub>2</sub>e per capita per year in 2045. Notwithstanding the decrease in per capita emissions rates between 2020 and 2045, the City of Manteca's anticipated per capita emission rates under the BAU scenario would exceed the emission targets shown in Table 6.

### **Statewide Programs Forecast**

The State of California has initiated numerous programs that act to reduce GHG emissions from a variety of sources throughout the State. Such programs have been enacted irrespective of the adoption of a CAP Update by the City of Manteca and would act to reduce GHG emissions from existing and future development within the City. Actions initiated as part of existing Statewide programs would include, but are not limited to, the RPS for electric utilities, low carbon fuel standards, building energy efficiency standards, water use efficiency standards, and solid waste reduction measures.

Considering that full implementation of the State's existing programs would reduce GHG emissions from existing and future development within the State, including within the City of Manteca, future emissions within the City of Manteca will likely be lower than the emissions presented under the BAU development scenario above. Consequently, a second emissions forecast scenario has been prepared to account for such Statewide programs. It should be noted that other than the inclusion of Statewide programs, all other assumptions related to future development within the City and emissions sources remained constant between the BAU emissions forecast and the emissions forecast with Statewide programs.

Although initiated at a Statewide level, the foregoing Statewide programs would result in demonstrable emissions reductions at a local level. For instance, the State's recently updated RPS program now requires that all electricity provided to customers by public utilities within the state be sourced solely from renewable sources by the year 2045. Because Pacific Gas & Energy (PG&E) is subject to the State's RPS requirements, electricity consumption within the City of Manteca in the years 2045 and beyond will not result in GHG emissions. Considering that electricity consumption represents a large existing source of GHG emissions from City activities, the elimination of such emissions due to implementation of the RPS program will result in the

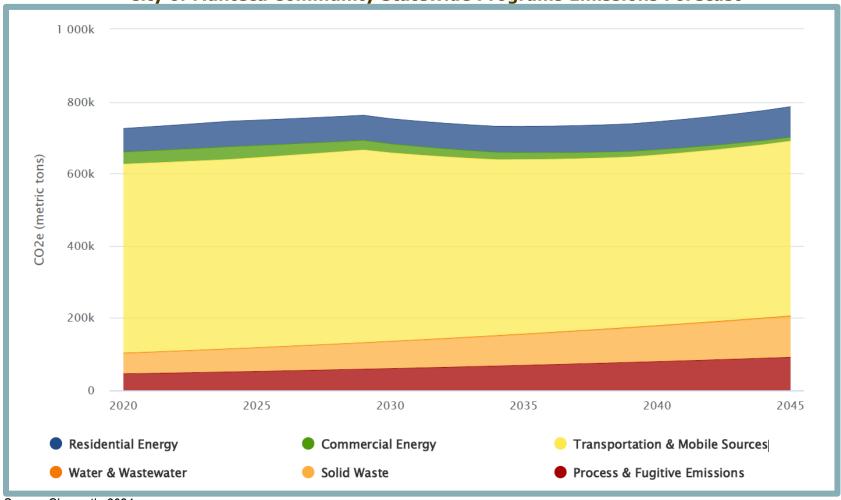
avoidance of a significant amount of GHG emissions. Similarly, Statewide requirements for low carbon fuel standards, zero emissions transit fleets, and vehicle efficiency standards will reduce the rate of emissions from vehicle use within the City of Manteca, irrespective of the City's adoption of this CAP Update.

Full implementation of currently adopted Statewide policies would result in substantial reductions to existing sources of emissions while also reducing the number of emissions that would be anticipated from future development. As a result, and as shown in Figure 13 through Figure 15 below, despite the continued growth of the City of Manteca, GHG emissions are anticipated to initially begin at the 2020 inventory level of 730,202 MTCO<sub>2</sub>e per year, then increase to 757,910 MTCO<sub>2</sub>e per year by 2030. Eventually, as growth intensifies within the City of Manteca past the year 2030, emissions are anticipated to rise to 792,214 MTCO<sub>2</sub>e/year in 2045. Estimated population, emissions level, and per capita emissions rates with inclusion of Statewide programs are presented in Table 7 through Table 9.

Table 7 City of Manteca Statewide Programs Government Forecast				cast
Year	20	30	204	<b>1</b> 5
Government Sector	Metric Tons (CO2e)	Sector		Percent of Sector Emissions
Buildings & Facilities	842	15%	1,153	18%
Vehicle Fleet	2,069	37%	1,820	28%
Employee Commute	728	13%	913	14%
Solid Waste Facilities	181	3%	141	2%
Water & Wastewater Treatment Facilities	1,310	24%	1,989	30%
Street Lights & Traffic Signals	109	2%	153	2%
Transit Fleet	322	6%	414	6%
Total	5,561	100%	6,583	100%
CO2e = carbon dioxide equivalents				

ICLEI City of Manteca. 2045 Government Operations Forecast. November 2024

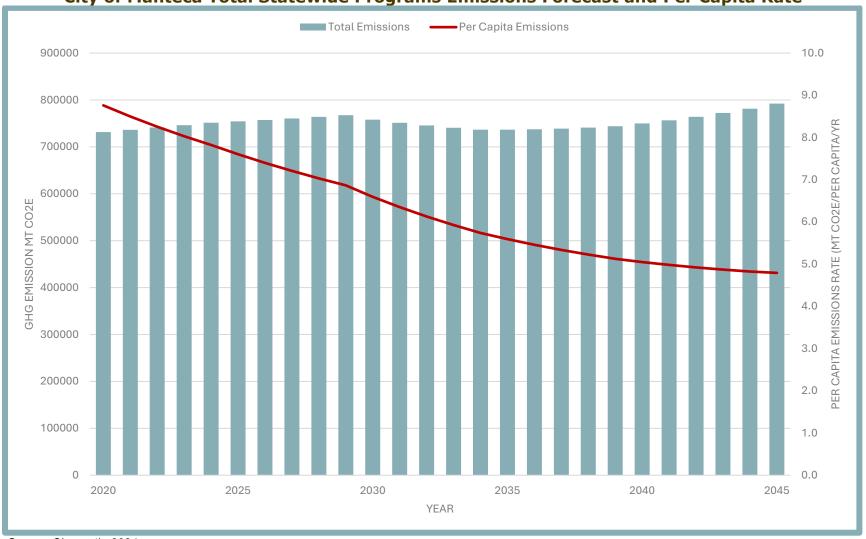
Figure 13
City of Manteca Community Statewide Programs Emissions Forecast



**City of Manteca Municipal Statewide Programs Emissions** 7k 6k 5k CO2e (metric tons) 3k 2k 1k 2020 2025 2030 2035 2040 2045 Transit Fleet Buildings & Facilities Street Lights & Traffic Signals Vehicle Fleet Solid Waste Facilities Employee Commute Water & Wastewater Treatment Facilities

Figure 14

Figure 15
City of Manteca Total Statewide Programs Emissions Forecast and Per Capita Rate



Source: Clearpath. 2024

Table 8				
City of Man	teca Statewide	Programs Cor	nmunity Fored	ast
Year	20	30	2045	
Community Sector	Metric Tons (CO2e)	Percent of Sector Emissions	Metric Tons (CO2e)	Percent of Sector Emissions
Residential Energy	69,395	9%	84,350	11%
Commercial Energy	25,279	3%	11,218	1%
Transportation & Mobile Sources	522,008	70%	484,097	62%
Solid Waste	74,179	10%	112,616	14%
Process & Fugitive Emissions	60,205	8%	91,401	12%
Total 751,066 100% 783,682 100%				
CO2e = carbon dioxide equivalents ICLEI City of Manteca. 2045 Community Forecast. November 2024				

Table 9				
Comparison o	f Total Statewide P	rogram Forecast	S	
	2020	2030	2045	
Population	83,498	114,934	165,302	
Total Community Emissions	730,202	756,627	790,265	
Per Capita Emissions Rate	8.75	6.58	4.78	
Exceeds Emissions Targets? YES YES YES				
Sources: Population Forecast for Manteca. November 2024; Clearpath, 2024.				

The inclusion of the adopted RPS requirements for energy generation results in large reductions in electricity related GHG emissions from municipal and communitywide activities. While Statewide programs reduce the emissions from the transportation sector from 2030 to 2045, the transportation sector remains the largest percentage of emissions in the community forecast

With the rapidly increasing reduction of emissions related to electricity consumption, mobile emissions sources (such as on-road vehicles as well as off-road equipment) represent the majority of emissions on a communitywide basis. As discussed previously, various Statewide programs have been enacted to reduce the GHG emissions intensity from mobile sources. The ultimate effect of existing Statewide programs is that the average vehicle driven in the years 2030 or 2045 will result in less intense GHG emissions per mile than vehicles driven today. Despite the reduction in emissions intensity per mile driven, the estimated growth in City population and resultant increases in Citywide vehicle miles travelled (VMT) is anticipated to result in an overall increase in mobile-source emissions through the year 2045. Such increases result in mobile-source emissions representing 70 percent of total emissions within the City of Manteca by 2030, and 62 percent of total emissions within the City of Manteca by 2045.

### 5.4 MEETING THE EMISSIONS TARGETS

Based on the City's goal of 6 MTCO2e in 2030 and carbon neutrality by 2045, along with Manteca's forecasted population in 2030 and 2045, the City would be required to reduce emissions by 111,584 MTCO2e by 2030 and 792,214 MTCo2e by 2045 to meet the reduction targets. While activities within the City of Manteca are anticipated to result in total emissions of 1,128,238 MTCO2e/yr with Business-as-Usual, and 792,214 MTCO2e/yr with Statewide programs in 2045, the implementation of CAP measures would reduce emissions further. The City of Manteca's targets, in line with the State, and per capita emission targets are discussed below.

# 2030 Reduction Target

The 2030 reduction target remains achievable, with the implementation of Statewide and CAP Update measures working together to reduce emissions. Prior to the use of local measures, the per capita emissions with Statewide programs are 6.58 MTCO2e/yr/capita in 2030. The implementation of the CAP Update measures closes the gap to reach the target, and the per capita emissions drop to 5.3 MTCO2e/yr/capita, below the target 6 MTCO2e/yr/capita.

### 2045 Reduction Target

The 2045 reduction target has made substantial progress although carbon neutrality could be unachievable in current forecasts due to costs, realistic implementation schedules, and current technology. While the State Programs forecast 4.78 MTCO2e/yr/capita, the implementation of the CAP Update measures forecast reduces emissions to 3.01 MTCO2e/yr/capita, which remains above carbon neutrality.

Consequently, the City of Manteca must adopt emission reduction measures to further reduce estimated future emissions. Reductions will be achieved through the implementation of programs and policies that target sectors on a local level. Manteca must implement these local actions to reach the 2030 target and make substantial progress towards the 2045 goal. The measures should remain feasible, cost effective, clear, measurable, and equitable as implemented. Chapter 6 of this CAP Update will introduce reduction measures necessary to ensure the City achieves an adequate emissions reduction.

The emissions forecasts are presented in Figure 16 through Figure 18 below.

Figure 16
City of Manteca Community Emissions Forecast with CAP Measures

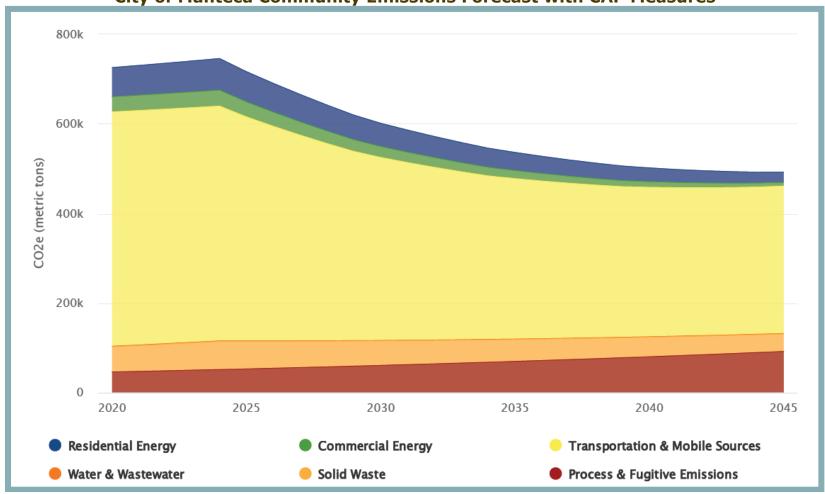
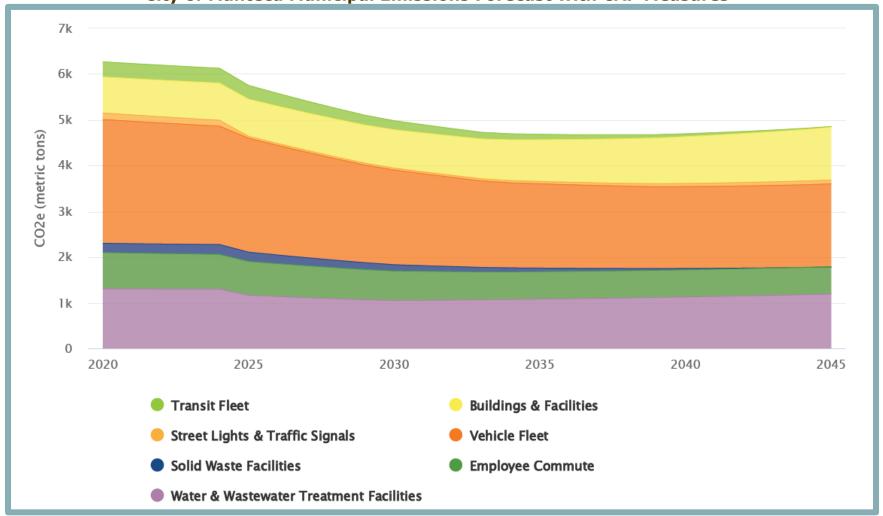
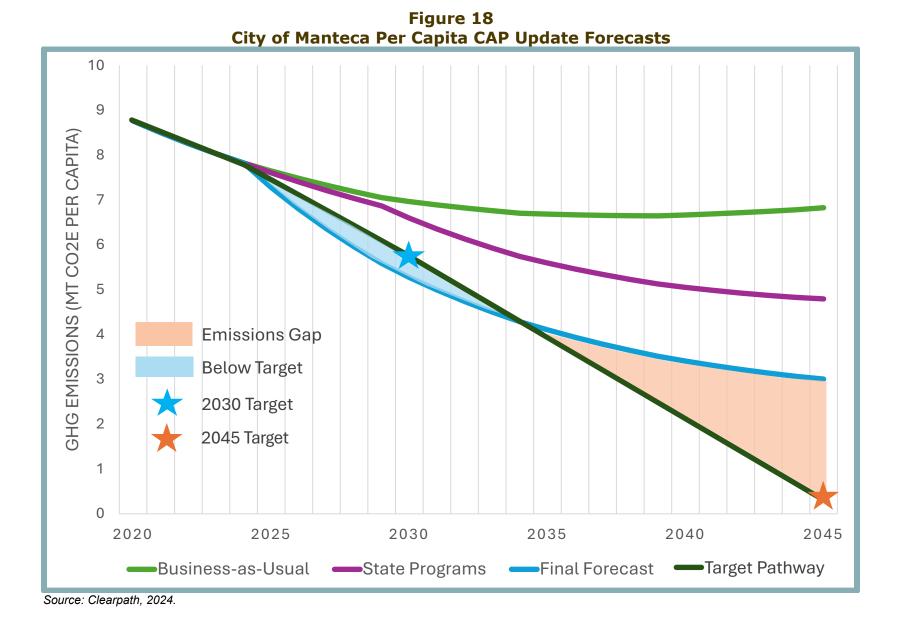


Figure 17
City of Manteca Municipal Emissions Forecast with CAP Measures





# 6. EMISSIONS REDUCTION MEASURES

# 6. EMISSIONS REDUCTION MEASURES

The following chapter outlines an introduction to emission reduction strategies and presents the proposed GHG emissions reductions measures. All emissions quantifications are presented in Appendix B to this CAP Update.

### 6.1 EMISSIONS REDUCTION BASICS

As discussed in Chapter 5 of this CAP Update, in addition to implementation of Statewide policies and regulations, local-action emission reduction measures are required for the City of Manteca to achieve the emission targets set by the Manteca Climate Action Plan Advisory Committee (CAPAC). The following reduction measures have been separated into several focus areas, each of which address the major sources of emissions associated with the City. The focus area categories correspond to the emissions estimations presented in Chapter 5.

For each emission reduction strategy, specific implementation actions are identified. Additionally, the party responsible for implementation of such actions is identified and labeled consistent with the key shown in Table 10. Implementing parties are broken into three categories: Existing, representing actions that would reduce existing emissions within the City of Manteca or be implemented within existing developments; Municipal, representing actions that would be implemented by the City of Manteca and would reduce emissions related to operations of the municipal government or the larger community; and Future Development, which represents actions that would be implemented by new development or redevelopment projects within the City. Additionally, the approximate overall cost is shown symbolically through the use of the key presented in Table 11. Co-benefits, such as public health and ecosystem health, are presented within Table 12 and are provided within each measure. Table 13 provides a summary of all measures included in this CAP Update.

### Reduction Measure Quantification

In addition to identifying the responsible parties, the quantified efficacy of each reduction measure is also specified. To the extent feasible, the efficacy of each reduction measure is quantified independently using the ClearPath software. However, in some cases the parameters of ClearPath do not allow for the individual quantification of reduction measures. As such, some reduction measures may have been grouped and quantified together.

It should be noted that all reduction measures take into account Statewide programs that would work to reduce emissions simultaneous to the City of Manteca's efforts. For instance, the State's Renewable Portfolio Standard (RPS) for publicly owned utilities was included in the ClearPath emissions modeling for all reduction measures as were various programs related to vehicle emissions reductions such as the State's Low Carbon Fuel Standard and Pavley fuel efficiency requirements. As discussed in Chapter 5 of this CAP Update, such Statewide programs have been considered during emissions forecasting. Therefore, the emissions reductions from such programs have already been accounted for and are not recounted in the following section. Additionally, the measures are quantified using the corresponding sector MTCO<sub>2</sub>e to produce percentage reductions as compared to each forecast's total emissions.

# Table 10 - Party Responsible Key

Existing

*Existing*: Represents actions that would reduce existing emissions within the City or be implemented within existing developments.



*Municipal*: Represents actions that would be implemented by the City and would reduce emission related to operations of the municipal government or the larger community.



Future Development: Represents actions that would be implemented by new development or redevelopment projects within the City.

Table 11 - CAP Measures Generalized Cost Key

Symbol	Approximate Cost
\$	Low
\$\$	Moderate
\$\$\$	High

Table 12 - CAP Co-Benefits Key

Symbol	Co-Benefit
	Public Health
	Ecosystem Health
	Infrastructure Improvement
**	Resource Preservation
	Climate Change Resilience
HIN	Social Equity

Table 13. CAP Goals and Measures		
GOALS	MEASURES	
Transportation (TR)		
Promote Alternative Transportation	TR.3: Increase Use of Alternative Transportation TR.4: Promote Alternative Transportation Through Updated Parking Standards	
Implement Electric Vehicle Infrastructure	TR.5: Optimize City Fleet TR.6: Support Electric Vehicle Adoption, Charging Infrastructure, and Alternative Fuels.	
Work to Increase Active Mobility	TR.1: Bicycle and Pedestrian Infrastructure Improvement TR.9: Safe Routes to School	
Reduce Single Occupant Vehicle Use and Emissions	TR.2: Congestion Management TR.7: Establish a Transportation Management Association TR.8: Mobile and Area Source Emissions Reductions	
Land Use (LU)		
Encourage Sustainable Growth	LU.1: Encourage Adaptive Reuse LU.2: Comply with State Affordable Housing Requirements LU.3: Sustainable Growth of New Development LU.4: Urban Tree Management Plan	
<b>Energy and Building Design</b>	(EG)	
Expand Renewable Energy	EG.1: Renewable Energy Production Plan EG.3: Renewable Energy Requirement for Private Development EG.4: Participate in Energy Programs	
Increase Lighting Efficiency	EG.8: Improve Lighting Efficiency	
Improve Building Design	EG.2: Resource Efficiency Improvements for City Buildings EG.5: Enforce CALGreen EG.6: Energy Efficient Design EG.7: Efficient Design of City Structures	
Water Conservation (WC)		
Increase Water Efficiency	WC.1: Community Wide Water Use Efficiency WC.2: Water Efficient Landscape WC.3: Sustainable Water Service	
Solid Waste Management (S	SW)	
Increased Waste Diversion	SW.1: Expand Municipal Recycling Program SW.2: Expand Yard Waste and Other Organics Composting SW.3: Improve Waste Management Practices.	

### 6.2 TRANSPORTATION RELATED MEASURES

The following section discusses the measures and actions relating to transportation within the City of Manteca. As mentioned in Table 13, the measures in this section all work towards four common goals, which include promoting alternative transportation, implementing electric vehicle infrastructure, increasing active mobility, and reducing single-occupant vehicle use and emissions.

# **Measure TR.1:** Bicycle and Pedestrian Infrastructure Improvement



### **Description**

Improve bicycle and pedestrian infrastructure within the community to increase non-motorized travel. Creating a more comfortable environment for cyclists, walkers, or users of the public transportation systems would encourage higher rates of usage among the population, encouraging active transportation and reducing single occupancy automotive trips.

initiatives This measure includes encourage active transportation with infrastructure improvements. Implementation of roadway and bikeway infrastructure improvements in existing rightof-way, such as "road diets," narrower pedestrian crossing distances, stormwater infrastructure, etc., to meet Green Streets standards and increase safety for pedestrians and bicycles. Subsidizing, or investing in public transit would be another encouraging factor, this effort would promote expansion of public transit routes and increased operation frequency Manteca to support day-to-day travel needs. This measure also includes improvements to the safety and atmosphere of public transportation, encouraging more residents to see public transport as a viable and safe mode of travel

This measure would also benefit from the expansion of the cities treescape and shade, especially during summer months. Increasing the shade cover of the City would

### **Co-Benefits**







also encourage these forms of transportation during the summers.

# **Action ID and Description**

Action TR.1.1

The City shall seek to obtain grant funding to support the following action items listed below.

### Action TR.1.2

Fulfill the Implementation Measures included in the City of Manteca Active Transportation Plan.

### **EXHIBIT A**

### **ATTACHMENT 5**

### Action TR.1.3

Focus on developing destinations and linking existing infrastructure to connect to these destinations.

### Action TR.1.4

Consider Green Streets standards in review of future development project applications, as appropriate.

### Action TR.1.5

Consider Green Streets standards in City Capital Improvement Plan projects throughout the City with appropriate design and consideration for location and use.

### Action TR.1.6

The City shall seek to obtain continued funding to support operations and maintenance (O&M) through funding mechanisms such as O&M Agreements, Homeowners Associations, etc.

2030 Reduction 0.009 percent 2045 Reduction 0.03 percent Approximate Cost \$\$

# **Measure TR.2: Congestion Management**



# **Description:**

Reduce congestion and calm traffic within downtown Manteca. The focus of proposed strategies would be to reduce vehicle speeds through the City such as the installation of raised median islands, raised crosswalks, chicanes, and rumble strips, as well as construction of roundabouts to ease congestion at intersections and provide gateways to the City. Reductions in congestion would reduce vehicle related emissions of GHGs, and traffic calming throughout downtown would promote the use of alternative means of transportation. The reduction in speed improves safety for alternative forms of transportation such as walking or bicycling, which are GHG emission free. Inclusion of similar congestion reduction and traffic calming strategies in future development would promote alternative modes of transportation and reduce congestion, that may otherwise be caused by new development, while creating a cohesive circulation network throughout the City.

Anti-Idling Strategies for roadways reduce vehicle idling by implementing strategies that reduce or remove impediments to the free flow of motor vehicles. Strategies include removal of four-way stop signs, diverging diamond intersections, permissive-protective left-turns, and traffic signal synchronization to provide efficient flow of traffic.

### **Action ID and Description**

Action TR.2.1

Synchronize traffic lights installed in future developments to ease traffic flow, which minimizes vehicle stopping and idling.

#### **Co-Benefits**



### Action TR.2.2

Require new developments to include traffic calming and congestion management measures, where deemed appropriate, with a target of 50 percent, of all proposed streets and intersections. Furthermore, the City shall seek to implement such strategies within existing areas of the City.

### Action TR.2.3

Establish a Downtown Specific Plan with policies and strategies specifically reflecting the principles of this measure.

### Action TR.2.4

The City shall seek to identify areas within the City Limits where safety or congestion has become a concern and work to develop Anti-Idling/Congestion Management Strategies suitable for addressing such concerns.

## **ATTACHMENT 5**

2030 Reduction 8.5 percent **2045 Reduction** 29.1 percent

## **Measure TR.3:** Increase Use Transportation

#### of Alternative



## **Description**

Through the Engineering and the Public Works Department, the City shall seek to existing infrastructure upgrade alternative transportation and require new development to include infrastructure for alternative transportation. Such upgrades may include extension of sidewalks. establishment of safe-routes to schools. restriping of roads to include bike lanes, and posting of "Share the Road" street signs. Additionally, the City shall comply with the California Complete Streets Act, which requires planning for "complete streets" as a component of future General Plan updates. In order to ensure proper implementation of such future policies, the City shall consider future adoption of a Complete Streets Ordinance, in line with the City's General Plan. Such upgrades may coincide and support the improvements discussed in Measure TR.1 and TR.9 or include site specific design features such as designated bus lanes or turnouts, solar supported bus stops, Park-N-Ride areas. bicycle sidewalk extensions, and infrastructure. Furthermore, new developments should be required to construct alternative transportation infrastructure on-site and connecting offsite, such as bicycle parking, and sidewalk connections.

## **Action ID and Description**

#### Action TR.3.1

Seek to comply with the requirements of the California Complete Streets Act.

#### Action TR.3.2

Adoption of a Complete Streets Ordinance.

#### **Co-Benefits**









#### Action TR.3.3

Establish/enforce minimum standards for bicycle parking.

#### Action TR.3.4

As determined, require new developments to connect to bicycle and pedestrian path connections while remaining consistent with the City's Active Transportation Plan.

#### Action TR.3.5

Periodically consider the feasibility of allowing bike share programs within Manteca based on changes in technologies and the City's population.

#### Action TR.3.6

Promote destination facilities such as lockers and showers at new non-residential developments through voluntary development design guidelines.

### **ATTACHMENT 5**

#### Action TR.3.7

Continue to implement Safe Routes to School program, tailor new bicycle and pedestrian infrastructure to promote active transportation to school for Manteca students.

#### Action TR.3.8

Manteca Transit shall seek to increase the frequency of existing bus services within the City.

#### Action TR.3.9

Manteca Transit shall establish a timeline for the potential future expansion of bus service within the City based on development within the City and population growth.

#### Action TR.3.10

Address stigma regarding alternative transportation by increasing safety, and marketing to promote alternate transportation.

2030 Reduction 0.23 percent **2045 Reduction** 0.27 percent

## **Measure TR.4:** Promote Alternative Transportation Through Updated Parking Standards



## **Description**

Updated parking standards can be used to discourage the use of single-passenger traditionally fueled vehicles. Such preference may be established through requirements for reserved parking for motorcycles, car share, carpool, and low emissions vehicles; adjustments to the minimum and maximum parking requirements to limit overall parking supply required for new development, thus encouraging carpooling and alternative modes of transportation; allow for shared parking areas between land uses; and require bicycle parking in proportion to vehicle parking. These measures can be focused on high trafficked areas of which parking lots make up approximately 20 percent of the land coverage. Decreasing both amount of parking, and ease of parking in this district and other high trafficked areas would encourage alternative transportation uses; therefore, encouraging the use of alternative fueled vehicles, ride sharing, and alternative modes of transportation which would reduce the vehicle miles travelled associated with City residents.

Develop financing/incentives for purchasing, using, and maintaining electric micromobility vehicles for personal use (such as bicycles, scooters, trailers). Include specific provisions for low-income and vulnerable populations. Conduct a parking pricing study and implement pilot projects to test their effectiveness. Reduce or eliminate minimum parking standards in new developments.

#### Co-Benefits







## **Action ID and Description**

#### Action TR.4.1

Implement development parking standards to discourage single-occupancy vehicle use in the City's Design Standards.

## Action TR.4.2

Seek to obtain grant funding for implementation of an EV/NEV shuttle program in the CBD.

#### Action TR.4.3

Include multi-level parking, where applicable, in high trafficked zones to promote density.

## Action TR.4.4

Add Charging and electric infrastructure, where determined feasible, to underserved areas of town as discussed in Measure TR.6.

## **ATTACHMENT 5**

## Action TR.4.5

Consider providing incentives for the use and maintenance of micromobility vehicles (ebikes, e-scooters, segways, etc.).

**2030 Reduction** 4.3 percent

**2045 Reduction** 14.6 percent

## **Measure TR.5: Optimize City Fleet**

## **Description**

The City shall use the inventory of all City owned vehicles, which includes the fuel consumed per year and the fuel economy for each vehicle. The City shall establish a target average miles per gallon (mpg) goal, for improving fuel economy across the City's entire vehicle fleet. The target mpg shall be designed to reduce fuel consumption by Cityowned vehicles. The City shall prioritize the purchase of alternatively fueled vehicles. As part of fleet optimization and fleetwide fuel economy improvements, the City shall ensure the proper maintenance of vehicles (such as proper tire inflation and oil changes) to ensure City vehicles operate at the maximum fuel efficiency possible and inform City employees of the benefits of reducing vehicle idling times.

To the extent feasible, the City shall consider focusing the purchase of new fleet vehicles to hybrid vehicles, electric vehicles, or alternative fuel vehicles. Such fleet improvements would likely occur over a long period of time as the City grows and expands the fleets used by the Public Works Department, Police Department, Department, and other forms of Municipal Transit.

Develop a plan to transition the municipal vehicle fleet to alternative fuels (e.g., electric, battery electric vehicle, hydrogen).

Address "first mile/last mile" and short-trip transportation needs by continuing to prioritize, fund, and implement on-going programs/partnerships and develop new programs/partnerships to provide alternative transportation options within Manteca. Include specific provisions for low-income or vulnerable populations. Include specific



action recommendations, pilot programs, or other ways to implement actions.

Coordinate with regional transit agencies and cities to promote cohesive transit interconnections, including express buses to neighboring areas.

## **Action ID and Description**

Action TR.5.1

Consult with San Joaquin Valley Air Pollution Control District (APCD) to seek grant funding opportunities.

#### Action TR.5.2

Set goal increase in miles per gallon for entire fleet.

#### Action TR.5.3

Implement policies for use of alternative fuel vehicles.

#### **ATTACHMENT 5**

#### Action TR.5.4

By 2030 require that 60 percent of new vehicles purchased for the City fleet be zero emissions vehicles, and all vehicles by 2040 purchased for the City fleet shall be zero emissions vehicles. Public safety vehicles shall be excluded, unless the City determines the comparable zero emission vehicles for Public Safety are equal to or superior in functionality, performance and duability to industry standards.

#### Action TR.5.5

Create or recommend policies for a reduction in idling time for City vehicles through education of City field crews.

#### Action TR.5.6

Recommend policies for the Manteca Unified School District to replace diesel-powered school buses with CNG buses, hybrid buses, or other emissions-reducing alternatives.

#### Action TR.5.7

Create or recommend policies for the City to use low or zero emissions vehicles wherever possible and practicable.

**2030 Reduction** 18.2 percent

**2045 Reduction** 76.0 percent

# Measure TR.6: Support Electric Vehicle Adoption, Charging Infrastructure, and Alternative Fuels



## **Description**

Recommend or create polices requiring the installation of electric vehicle (EV) charging stations at existing and future commercial developments within the City, particularly near State Route 99 and State Route 120. Establish minimum ΕV charging requirements for new residential developments and require electrification of new or proposed loading docks in commercial and industrial developments within the City. Install EV charging stations in existing public parking areas, such as those related to government offices or recreation areas. Locating a charging station within the community will encourage intra-community electric vehicle use as well as EV use along State Route 99 and State Route 120.

Update and implement the public and private charging infrastructure needs, time frame, and implementation approach to enable all vehicles to transition to electric. Identify and implement the first five-year plan including specific locations and feasibility, costs, potential grant funding and partners, electric vehicle adoption needs and opportunities, and support alternative/hydrogen fuel. Include provisions for low-income and vulnerable community members. Aim to increase community-wide passenger EV vehicle adoption to 20 percent by 2030 and 55 percent by 2045.

## **Action ID and Description**

Action TR.6.1

Seek funding to support electric vehicle charging/hydrogen or other new vehicle technology and seek to incentivize future gas stations to provide alternative fuel options.



#### Action TR.6.2

Update Municipal Code to require charging stations as part of new development and identify potential sites for an Electric Vehicle charging station within City Limits.

#### Action TR.6.3

Establish targets for the number of EV charging stations installed at public parking areas by the year 2026.

#### Action TR.6.4

Pending available funding require installation of Electric Vehicle charging stations at all new municipal facilities that include vehicle parking.

#### Action TR.6.5

The City shall identify existing municipal facilities where Electric Vehicle charging stations could be installed. Once feasible sites are identified, the City shall pursue

## **ATTACHMENT 5**

grant funding for installation of public Electric Vehicle charging infrastructure. Identification of suitable locations for EV charging stations at existing facilities shall be completed by the year 2026.

#### Action TR.6.6

All existing and future City-run areas with paid parking, shall consider allowing for EV's to be exempt from payment of parking fees to encourage use of EVs within the City.

#### Action TR.6.7

Target the installation of EV charging stations capable of charging Electric Trucks along highway corridors and existing EV charging station locations.

#### Action TR.6.8

Support Electric vehicles and zero-emission vehicles car share companies in coming into the City. Look into opportunities with agencies to purchase rebate programs to provide a higher trade-in value for combustion vehicle to aid low-income and vulnerable community members.

**2030 Reduction** 12.8 percent

**2045 Reduction** 43.7 percent

## **Measure TR.7:** Establishment of a Transportation Management Association



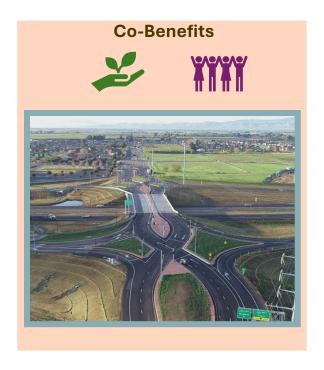
## **Description**

The City shall seek to establish a Transportation Management Association (TMA). The TMA may be operated by the City, transit provider, Business Association, or another entity as appropriate, and operations of the TMA may be conducted independently from or in concert with other nearby jurisdictions and TMAs. In general, TMAs provide ongoing training and special assistance to TMA members for the implementation of commute alternative programs at work sites, including monthly networking meetings and assistance with work site program design. TMA activities include outreach to area employees and residents in an effort to provide varied commute choices, including bicycle and vanpool subsidies, vanpool formation assistance, and transit information.

## **Action ID and Description**

Action TR.7.1

In concert with SJCOG, San Joaquin Valley APCD, and other local jurisdictions, the City shall seek to establish, participate in, or form a TMA by the year 2030.



#### Action TR.7.2

New developments shall be required to demonstrate membership within future TMAs servicing the City of Manteca.

2030 Reduction 0.14 percent 2045 Reduction 0.16 percent

## **Measure TR.8:** Mobile and Area Source Emissions Reductions



## **Description**

The City shall seek to reduce emissions from mobile sources other than on-road vehicles. While on-road vehicles, such as passenger cars and heavy-duty trucks, represent the majority of emissions from mobile sources within the City of Manteca, emissions from other mobile sources contribute significant amounts of emissions. For instance. operations of fossil-fuel powered landscape equipment, maintenance construction equipment, recreational vehicles, industrial equipment all result in GHG emissions from combustion of gasoline, diesel, or natural gas. The City shall seek to implement various means of controlling emissions from such sources through electric-powered encouragement of landscaping equipment, requirements for construction equipment used within the City Limits, and other actions.

## **Action ID and Description**

#### Action TR.8.1

By the year 2045, require all construction fleets operating within the City of Manteca to meet U.S. EPA Tier 4 engine standards. The suggested timeline for implementation of this measures is for 10 percent of the pieces of equipment in construction fleets operating within the City in the year 2026 to meet the U.S. EPA's Tier 4 standard, with the proportion of vehicles in the fleet meeting such standards increasing to 30 percent in 2030, 60 percent in 2035 and 100 percent in 2045. The percentage shall be calculated by dividing the number of Tier 4 pieces of equipment by the sum of all pieces of construction equipment used in the fleet, multiplied by 100. Compliance with this measure may be achieved through use of Tier 4 engines or implementation of similar

#### **Co-Benefits**







methods or technologies to achieve equivalent reductions in construction fleet emissions. The City will continually comply with Federal and State requirements throughout implementation.

#### Action TR.8.2

To the extent feasible, projects subject to Site Plan and Design Review shall be required to include outdoor electrical outlets that allow for the use of electrically powered landscaping equipment.

#### Action TR.8.3

Projects subject to Site Plan and Design Review that would include truck loading docks shall be required to include electrical outlets for each loading dock to reduce the amount of truck idling and truck refrigeration unit generator use.

### **ATTACHMENT 5**

#### Action TR.8.4

Municipal facilities shall seek to switch from gas powered landscaping equipment to electrical landscaping equipment. Additionally, new municipal facilities shall consider designing buildings with outdoor outlets to support electrically powered landscaping equipment.

#### Action TR.8.5

The City shall promote any future San Joaquin Valley APCD or PG&E programs that support replacement of fossil fuel powered landscaping equipment with electrically powered landscaping equipment.

#### Action TR.8.6

The City shall require all construction sites to connect to existing grid power to support construction activities, where feasible.

2030 Reduction 2.0 percent **2045 Reduction** 6.5 percent

### Measure TR.9: Safe Routes to School



## **Description**

Collaborate with the local school district to improve pedestrian crossings, promote active transportation to school, and develop educational programs focusing on bicycle safety. In conjunction with SJCOG and the local school district, efforts will be made to enhance pedestrian crossings, encourage active transportation, add shelters to bus stops, and implement safe routes to school linkages between community schools and new developments. It should be noted that citywide pedestrian and bicycle infrastructure improvements mandated by Measure TR.1 may facilitate the implementation of this measure.

### **Action ID and Description**

#### Action TR.9.1

Fulfill the Implementation Measures included in the City of Manteca's Active Transportation Plan.

#### Action TR.9.2

Ensure future expansion of school campuses include designations of safe routes to school for each new school site.

#### Action TR.9.3

Require new development proposals within areas designated as Safe Routes to School to show pedestrian and bicycle improvements within development plans sufficient to provide students with a safe means of walking or bicycling to school.

#### **Co-Benefits**









#### Action TR.9.4

Work with the local school district to promote walking or biking groups wherein organized groups of students walk or bicycle to school under the supervision of designated chaperones.

#### Action TR.9.5

Improve existing pedestrian routes to school: The City shall survey existing pedestrian routes to school and identify priority areas for targeting with this program. Additionally, the City shall pursue grant opportunities to fund improvements.

**2030 Reduction** 0.005 percent

**2045 Reduction** 0.02 percent

#### 6.3 LAND USE RELATED MEASURES

The following section discusses the measures and actions relating to land use within the City of Manteca. As mentioned in Table 13, the following measures fall under the goal of sustainable growth.

## **Measure LU.1:** Encourage Adaptive Reuse



## **Description**

The City shall promote and or create policies for the adaptive reuse of existing buildings, vacant lots, and underutilized areas of Downtown Manteca. Such reuse should be focused on increasing the density of development within the City, while providing community amenities and opportunities for innovative site developments.

## **Action ID and Description**

#### Action LU.1.1

Consider reducing impact fees for development that includes reuse of existing structures or infill development.

#### Action LU.1.2

Provide streamlined project review of projects that include reuse of existing structures or infill development.





2030 Reduction 0.01 percent **2045 Reduction** 0.33 percent

## **Measure LU.2:** Comply with State Affordable Housing Requirements



## **Description**

The City shall comply with existing State law related to the provision of affordable housing.

## **Action ID and Description**

Action TR.10.1

Consider future updates to the City's Municipal Code to allow for additional increased density through density bonuses based on inclusion of affordable housing units in proposed developments.

Action TR.10.2

Comply with the State Affordable Housing Requirements



**2030 Reduction** *Supportive* 

**2045 Reduction** *Supportive* 

## **Measure LU.3: Sustainable Growth of New Development**



## **Description**

The City shall create policies to promote new development within the City that use sustainable growth principles, such as encouraging mixed uses and infill development, locating higher-density developments near existing services and amenities, and encouraging alternative modes of transportation.

## **Action ID and Description**

#### Action LU.3.1

Continue to integrate SJCOG's Smart Growth Principles into the City's Development Guidelines and seek to streamline the permitting process for developments demonstrating consistency.

#### Action LU.3.2

Establish standards for "walkable neighborhoods", where new residential development (particularly multi-family developments) shall be located within one half mile of a combination of at least two of the following amenities: a park, a school, a grocery store, or a commercial development.

#### **Co-Benefits**







2030 Reduction 0.29 percent 2045 Reduction 1.0 percent

## **Measure LU.4:** Urban Tree Management Plan



## **Description**

The City shall seek funding for the update of the Urban Tree Management Plan. The plan shall include provisions for the maintenance of existing trees, the planting of new trees, requirements for tree planting developments, methods of improving the existing urban forest, and tree protection guidelines. An Urban Tree Management Plan shall formalize the City's goal of encouraging the expansion of the City's urban forest canopy, comprising shade trees along City streets and trees located on private property and in open spaces. The City's Urban Tree Management Plan shall be designed in compliance with California's Urban Forestry Act of 1978, making the Plan eligible to seek grant funding through the State's Urban & Community Forestry Program.

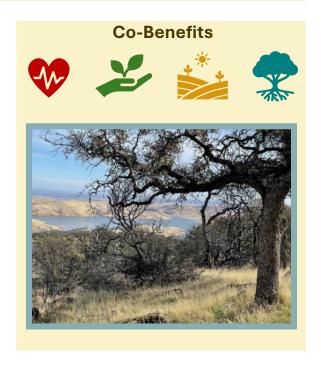
#### **Action ID and Description**

## Action LU.4.1

Pursue grant funding from CAL FIRE, USFS, California's Urban & Community Forestry Program, or other agencies to fund urban forestry planning within the City.

## Action LU.4.2

Update and implement Urban Tree Management Plan.



#### Action LU.4.3

Update landscaping regulations to require shade over at minimum 35 percent over City parks and include maintenance requirements of new trees.

## Action LU.4.4

Seek opportunities for partnerships with agencies promoting urban forestry such as ReLeaf California, and the California Urban Forests Council.

2030 Reduction

4.4 percent

2045 Reduction

#### 6.4 ENERGY AND BUILDING DESIGN RELATED MEASURES

The following section discusses the measures and actions relating to energy and building design within the City of Manteca. As mentioned in Table 13, the measures in this section all work towards three common goals, which include expanding renewable energy, increasing lighting efficiency, and improving building design.

## **Measure EG.1:** Renewable Energy Production Plan



## **Description**

The City shall aim to identify existing renewable energy sources and assess new City facilities for solar panel installation feasibility, while establishing a renewable production goal for Additionally, the City will explore "Community projects and Power Purchase Agreements, while also encouraging private solar panel installation. Consideration will be central renewable to installations to meet building standards. To achieve these goals, the City will increase building and transportation electrification capacity, invest in community solar energy and solar battery storage, and encourage residents to opt for high-efficiency energy options. Furthermore, the City will develop financing and incentive programs for energy improvements.

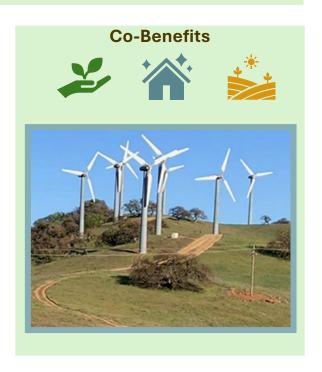
## **Action ID and Description**

#### Action EG.1.1

Encourage future commercial development, as well as existing consumers of large amounts of electricity, to install solar panel infrastructure beyond CalGreen code requirements.

#### Action EG.1.2

Work with local utility providers and other concerned parties to acquire funding sources for solar energy projects.



#### Action EG.1.3

Promote participation in Energy Upgrade California, as well as other State, federal, and utility incentive programs for improving home and business energy efficiency.

#### Action EG.1.4

Consider investment in Power Purchase Agreements and solar battery storage.

#### Action EG.1.5

Inventory City facilities and properties that could be developed with solar power

## **ATTACHMENT 5**

installations and establish a 2045 production goal based on available installation sites.

## Action EG.1.6

Produce a Renewable Energy Production Plan summarizing the City's efforts and establishing the 2045 production goal.

2030 Reduction	2045 Reduction	Approximate Cost
1.6 percent	8.4 percent	\$\$\$

## **Measure EG.2:** Resource Efficiency Improvements for City Buildings



## **Description**

City buildings and facilities operations account for approximately 29 percent of municipal emissions: thus. reducina emissions from this sector would greatly reduce overall municipal emissions. The City should conduct energy audits for existing facilities, and the City should implement all recommendations for energy efficiency improvements for municipal buildings. In addition, the City shall conduct resource efficiency audits for all City buildings and facilities focused on improving water efficiency, improving interior building climate controls, upgrading building and facility appliances, prioritizing equipment and appliance replacement to improve energy efficiency, educating employees on reducing energy demand, increasing renewable energy production in municipal facilities.

## **Action ID and Description**

#### Action EG.2.1

Assess energy use for all existing municipal facilities and establish a goal for increasing energy efficiency throughout all existing municipal facilities by 30 percent by 2030 and 100 percent by 2045.

#### Action EG.2.2

Conduct systematic energy audits of municipal facilities, prioritize largest energy consuming facilities and investigate means of reducing energy demand from municipal facilities.



## Action EG.2.3

Promote participation in Energy Upgrade California, as well as other State, federal, and utility incentive programs for improving home and business energy efficiency.

#### Action EG.2.4

Produce an Energy Efficiency Plan that shall include targeted measures to reduce energy demand within existing City facilities. The Energy Efficiency Plan shall include results of energy audits, recommendations for increasing energy efficiency following the facility audits, and updates for the City's progress in achieving the recommendations of the energy audits.

## **ATTACHMENT 5**

Action EG.2.5

Apply energy efficiency recommendations from municipal facility audits and Energy Efficiency Plan.

2030 Reduction	2045 Reduction	Approximate Cost
0.9 percent	2.1 percent	\$\$\$

## **Measure EG.3:** Renewable Energy Requirement for Private Development



## **Description**

The City shall implement the requirements of the 2022 California Building Standards Code related to PV systems for new residential development. Specifically, all low-rise residential buildings (including single-family units, duplex units, and multi-family units that are three stories or fewer) shall have a minimum solar zone dependent on the specific areas of the roofing. In addition, the Citv shall implement development requirements for commercial facilities larger than 3,000 square feet that at least 15 percent of the estimated energy demand of the project must be satisfied through renewable sources. Renewable energy may either be included on-site, as part of the project, or may be attained through off-site options such as community solar projects or other methods.



## **Action ID and Description**

Action EG.3.1

Update the City's Municipal Code to incorporate the most recent California Building Standards Code.

#### Action EG.3.2

Adopt minimum renewable energy standards for new commercial developments.

#### Action EG.3.3

Implement applicable Design Review standards that include renewable energy standards.

## **ATTACHMENT 5**

2030 Reduction 11.7 percent **2045 Reduction** 40.5 percent

## **Measure EG.4:** Participate in Energy Programs

## **Description**

California Cities are allowed to designate areas within Cities where property owners may enter voluntary agreements to help finance the installation of renewable energy and increases in energy efficiency through low-interest loans. Repayment of the loans is included in the property owner's property tax bill.

Pacific Gas & Electric Company (PG&E) maintains energy-savings programs. PG&E programs include rebates for home upgrades, design support, low-income weatherization programs, and programs to reduce peak energy demand.

## **Action ID and Description**

Action EG.4.1

The City shall encourage local homeowners to participate in programs as a means to finance solar panel installations, roofing and installation upgrades, and other energy-saving home improvements.

#### **Co-Benefits**



EG.4.2
Advertise energy saving programs on the City's website and at community facilities.

2030 Reduction 0.6 percent 2045 Reduction 1.8 percent

## Measure EG.5: Enforce CALGreen



## **Description**

The City shall ensure that all building plan checks include a check for consistency with the State's most up-to-date California Green Building Standards Code (CALGreen). The CALGreen Code promotes environmentally responsible, cost-effective building methods that are intended to save energy and water, while increasing the environmental safety of new developments. Additionally, the City shall consider the feasibility of adopting Tier 1 voluntary standards for new construction.

Continue to update the City's residential and non-residential codes to encourage all-electric new construction and increase electric vehicle charging infrastructure requirements; adopt a requirement that all new municipal building construction must be all-electric.

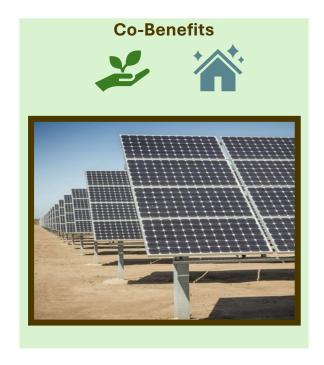
## **Action ID and Description**

#### Action EG.5.1

All building plan checks shall include consistency checks to ensure new development is constructed in compliance with the CALGreen Code effective at the time of the plan check.

#### Action EG.5.2

The City Council shall consider the viability of adopting CALGreen Tier 1 standards for new development. If the CALGreen Tier 1



standards are found to be viable, the City shall adopt the CALGreen Tier 1 standards, and the CALGreen Tier 1 standards shall be updated along with the triennial update of the CALGreen Standards.

## **Measure EG.6:** Energy Efficient Design



## **Description**

The City shall update design guidelines and design review standards to encourage the use of energy efficient building design techniques. Such building design measures may include features not explicitly discussed in the CALGreen Code, such as the use of passive solar, solar water heaters for structures and swimming pools, efficient water heating requirements, green roofs, and other innovative techniques to reduce building energy demands.

Additionally, the City shall incentivize the creation of community microgrids and the networking of local energy sources. Continually create and/or support resiliency hubs that remain in operation during a power grid outage.

## **Action ID and Description**

Action EG.6.1

Include energy efficient design recommendations within the City's Community Design Standards to reduce building energy demands.

#### Action EG.6.2

Update design review standards to remain consistent with the current CALGreen Code.



#### Action EG.6.3

Incentivize the creation of community microgrids and networking local energy sources to support energy resiliency.

#### Action EG.6.4

Encourage the use of green roofs and solar water heaters for new structures and during building renovations.

2030 Reduction 18.6 percent **2045 Reduction** 64.2 percent

## **Measure EG.7:** Efficient Design of City Structures



## **Description**

During design of new municipal structures, the feasibility and cost-effectiveness of designing new municipal structures to the Tier 1 standards of the CALGreen Code shall be formally evaluated. Should the evaluation show that implementation of the Tier 1 CALGreen standards for the new municipal building be feasible and cost-effective, the City shall construct the new building to such standards. The City shall aim to switch from fossil gas to electricity in all existing City facilities with the thresholds of 30 percent by 2030 and 100 percent by 2045.

## **Action ID and Description**

Action EG.7.1

During preliminary City evaluation of design considerations for new municipal structures, the City shall incorporate a feasibility and cost-effectiveness evaluation for designing new structures in compliance with the Tier 1 CALGreen standards.



#### Action EG.7.2

The City shall invest in switching existing City facilities from fossil fuels to electricity in the effort to phase out fossil fuel use.

2030 Reduction 11.5 percent **2045 Reduction** 39.9 percent

## **Measure EG.8:** Improve Lighting Efficiency



## **Description**

As part of its LED Streetlight Replacement recently Program. PG&E replaced conventional high-pressure sodium-vapor (HSVP) and metal halide lamps in City streetlights with LED lamps. LED lamps are more efficient than traditional lighting technologies and have a much longer lifespan, among other benefits. Future municipal and private development shall be constructed with the use of LED fixtures in all outdoor lighting to save energy and reduce operating costs. In addition, the City shall consider off-grid lighting options for future developments.

## **Action ID and Description**

Action EG.8.1

Require use of LED streetlights and other outdoor light fixtures for future development projects within the City.

#### Action EG.8.2

Where feasible, implement off grid lighting for future developments.



2030 Reduction 8.8 percent 2045 Reduction 13.0 percent

#### 6.5 WATER CONSERVATION RELATED MEASURES

The following section discusses the measures and actions relating to water conservation within the City of Manteca. As mentioned in Table 13, the three related measures seek to achieve the goal of increasing water efficiency within the City.

## **Measure WC.1:** Communitywide Efficiency

Water

Use



## **Description**

The City's Public Works Department provides potable water for the City. As a water purveyor, the City is uniquely situated to encourage water use efficiency throughout the community. To measure progress towards increasing community water use efficiency, the City shall set a per capita water consumption goal, based on the existing water consumption in City. To achieve the water use efficiency goal, the City should consider methods of reducing community-wide water use such as offering free water audits to community members, facilitating community use of statewide programs, such as the Save Our Water Rebates, and recommending conservation measures for implementation throughout the City.

### **Action ID and Description**

Action WC.1.1

Seek funding sources relating to the promotion of water use efficiency.

#### Action WC.1.2

Identify current per capita water consumption within the City and establish per capita water use reduction goal.



#### Action WC.1.3

Implement strategies, including the conservation measures within the most recent Urban Water Management Plan, to achieve the required water use reduction.

## Action WC.1.4

Every CAP inventory update, assess progress towards per capita water consumption goals and adjust goals as needed.

2030 Reduction 16.2 percent 2045 Reduction 29.4 percent

## **Measure WC.2:** Water Efficient Landscaping



## **Description**

All new private development, new municipal facilities, and public areas shall be landscaped using water efficient designs. Additionally, consistent with the City's water efficient landscaping ordinance, the City shall encourage the use of low maintenance landscaping. Water efficient landscaping and low maintenance landscaping reduce water demand from landscaping by up to 20 percent, save money in maintenance costs, and reduce the GHG emissions related to landscape maintenance.

The City shall seek to develop financing/incentive options with specific provisions for low-income and vulnerable populations that promote climate-ready private landscapes, such as installing drought tolerant, native, climate ready plants and/or xeriscaping; programs that support turf removal; installing rainwater capture and harvesting equipment; and the use of green stormwater measures to enhance natural water infiltration.

## **Action ID and Description**

Action WC.2.1

The water efficient landscaping ordinance shall be reviewed and updated with every CAP inventory update to reflect a balanced approach to water conservation.



#### Action WC.2.2

Incentivize retrofitting and provide financing options for conversions of existing landscapes.

#### Action WC.2.3

Update Municipal Code to allow for grey water capture and reuse within private developments while focusing on closed water systems.

2030 Reduction
Supportive

**2045 Reduction**Supportive

#### Measure WC.3: Sustainable Wastewater Service



## **Description**

In the event that the City elects to construct a new wastewater treatment plant, the new plant shall be designed to incorporate methane gas recovery and energy cogeneration systems or other technologies that could reduce GHG emissions related to wastewater treatment, similar to the existing wastewater treatment plant. Should the City continue to operate the existing wastewater treatment plant, the City shall investigate the feasibility of incorporating renewable energy systems to provide a GHG free source of electricity to the treatment plant.

## **Action ID and Description**

Action WC.3.1

Prioritize GHG emissions reductions during design and operation of City Wastewater Treatment Plant(s).

#### Action WC.3.2

Consider the feasibility of future use of recycled water to meet landscaping irrigation needs and target reuse of 10 percent of total wastewater.



## Action WC.3.3

The City should investigate the feasibility of incorporating a renewable energy system at the City's Wastewater Treatment Plant to provide a source of renewable energy that can meet the electrical needs of the Plant.

2030 Reduction 16.8 percent **2045 Reduction** 30.5 percent

#### 6.6 SOLID WASTE RELATED MEASURES

The following section discusses the measures and actions relating to solid waste within the City of Manteca. As mentioned in Table 13, the three related measures seek to achieve the goal of increased waste diversion.

## **Measure SW.1:** Expand Municipal Recycling Program



## **Description**

The City shall expand the use of recycling bins at municipal facilities such as public parks, community centers, school facilities, and in the downtown area of the City.

## **Action ID and Description**

#### Action SW.1.1

Identify and map areas in the City where municipal trash and recycling collection receptacles are located.

#### Action SW.1.2

Establish a plan for expanding municipal recycling services through collocating recycling receptacles with trash receptacles.

#### Action SW.1.3

The City shall investigate the feasibility of expanding the type of items within the recycling stream and target single use plastics.



2030 Reduction 0.04 percent 2045 Reduction 0.1 percent

## **Measure SW.2: Expand Yard Waste and Other Organics Composting**



## **Description**

The City should investigate expanding the yard waste service to include composting services for organic wastes such as residential and commercial food waste. Expanding organics composting would reduce the amount of waste produced within the City and reduce the amount of GHG emissions from waste disposal. If expansion of the City's organics program is found not to be feasible, the City shall promote and support residents to begin home composting.

## **Action ID and Description**

#### Action SW.2.1

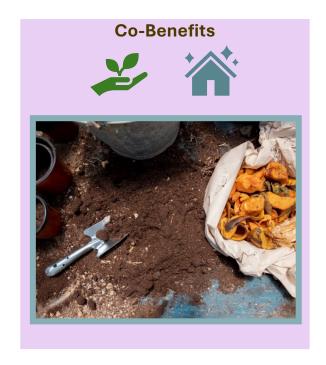
The City shall establish waste reduction goals consistent with Statewide waste reduction requirements (SB 1383, AB 1572, AB 939).

#### Action SW.2.2

The City should promote yard waste programs and expand organics collections.

#### Action SW.2.3

The City should consider innovative new technologies for facilitating composting, such as the use of biodigesters or City-operated composting facilities.



#### Action SW.2.4

If the City finds expansion of organics collections programs infeasible, the City shall seek grant funding to promote and support home composting programs by providing small-scale home composting equipment or encourages use of biodigesters or City-operated composting facilities.

#### Action SW.2.5

The Solid Waste Division shall discuss potential expansion of composting services.

2030 Reduction 13.1 percent 2045 Reduction 30.8 percent

## **Measure SW.3: Improve Waste Management Process**



## **Description**

The City should investigate improving the waste management facilities to expand capacity for organic and recycled waste and to decrease the number of fugitive emissions produced from the breakdown of organic matter. This measure would support these improvements through incentives to develop new waste facilities, and to capture gas at existing facilities.

## **Action ID and Description**

#### Action SW.3.1

Conduct a feasibility study and in coordination with the applicable landfill to improve and implement landfill gas system pilot project at privately managed landfills by 2030 to exceed State requirements by 10 percent by 2045.

#### Action SW.3.2

Incentivize and continue the development of new composting/anaerobic digestion facilities and on-farm digesters to divert compostable waste from landfills and sell the byproduct(s).



#### Action SW.3.3

Study options to expand and/or identify new opportunities to manage hard to recycle materials in the unincorporated area through additional hauler services, drop-off locations and/or Center for hard to recycle materials.

2030 Reduction 12.1 percent 2045 Reduction 23.7 percent

#### 6.7 **REDUCTION MEASURE SUMMARY**

It should be noted that while the emissions reductions presented in Chapter 5 are for the years 2030 and 2045, the majority of mitigation measures presented above would result in GHG emissions reductions beginning in the year of adoption and extending past target years. For instance, the recent Waste to Fuel Program implemented on City garbage trucks as part of the City of Manteca's effort to divert organic waste and use it as fuel which results in GHG emissions reductions for the lifespan of such programs. Consequently, the emissions reductions measures would serve to reduce anticipated emissions in the year 2030 to below the per capita emissions target for 2030.

As shown in Section 5.3 in Chapter 5, the emissions reduction through Statewide programs would reduce anticipated emissions in the year 2045 by 336,024 MTCO<sub>2</sub>e, which equates to an approximately 30 percent reduction from the BAU forecasted emissions level for 2045. Considering the anticipated level of emissions reductions that would be achieved by implementation of this CAP Update, emission reductions in the year 2045 would be anticipated to equal approximately 631,544 MTCO<sub>2</sub>e/yr. With an estimated population of 165,302 residents in the year 2045, the estimated remaining 496,694 MTCO<sub>2</sub>e/yr emissions rate in 2045 would result in a per capita emissions rate of 3.01 MTCO<sub>2</sub>e/yr. Despite the overall reduction in GHG emissions from present levels, as currently calculated, such reductions would not be sufficient to achieve the City's reduction goal of reaching carbon neutrality.

As shown throughout this CAP Update, emissions within the City of Manteca during the year 2030 would result in per capita emissions below the City's per capita emissions goal for the year 2030. Although the emissions reduction measures included in this CAP Update would not be sufficient to meet the City's goal for the year 2045, the emissions reductions achieved by implementation of the foregoing emissions reduction measures would be significant and would place the City of Manteca on a path to achieving their per capita emissions goal for 2045. Further progress towards obtaining the City's per capita emissions goal for 2045 would be made during the subsequent CAP update processes. Because the City of Manteca has been demonstrated to remain consistent with the State's GHG emissions targets and the State's 2022 Scoping Plan for the year 2030, this CAP will provide sufficient direction to guide the City's emissions reductions through 2030. However, in order to ensure that the City's emissions trajectory continues to decline in accordance with the City's emissions goal for the year 2045, after the year 2030, the City shall update the CAP more regularly, in intervals not to exceed five years. Updating the CAP in the future will ensure that the reduction calculations and emissions forecasting remain up to date. Furthermore, subsequent future updates to the CAP will allow for the incorporation of new emissions reduction technologies and methodologies that are not currently known. Although new technologies are speculative at this time, the proliferation of zero emissions passenger and freight vehicles as well as autonomous vehicles is one example of an impending technological change with effects that are difficult to predict at this early stage of development.

Nevertheless, by achieving the City's per capita emissions goal for the year 2030 and ensuring that communitywide emissions would continue to decline through the year 2045, this CAP ensures that the City of Manteca will achieve continued progress towards achieving the legislative requirements of SB 32. Although emissions reductions sufficient to meet the legislative emissions reduction requirements of Executive Order (EO) B-55-18 cannot be demonstrated at this time.

## **EXHIBIT A** ATTACHMENT 5

the implementation of the emissions reductions strategies included in this CAP Update will result in on-going GHG emissions reductions and allow the City to incorporate further emissions reductions strategies in the future, sufficient to reach the emissions reduction requirement of AB 32, SB 32, and EO B-55-18.

## 7. IMPLEMENTATION

#### 7. IMPLEMENTATION

The following chapter describes how the City will generally proceed to implement the emissions reduction measures presented in Chapter 6 of this CAP Update. In addition, this chapter identifies potential funding sources and resources related to project funding that the City may pursue to support implementation and achieve the emissions goals presented.

#### 7.1 IMPLEMENTATION

The emissions reduction measures presented in Chapter 6 include specific actions that delineate the timeline for measure implementation and the party or parties responsible for strategy implementation. As discussed in Chapters 5 and 6 the emission levels within the City of Manteca in 2030 would comply with the emission targets established by the City and the 2022 Scoping Plan. Consequently, the City of Manteca would comply with the Statewide emissions reduction targets established by SB 32. Although the emissions reduction measures included in this CAP Update would result in a 61.1 percent reduction in emissions from the Business as Usual (BAU) levels forecasted for the year 2045, such emissions reductions would not be sufficient to meet the goal of carbon neutrality established by the Climate Action Plan Advisory Committee (CAPAC), the 2022 Scoping Plan, and Executive Order (EO) B-55-18. Nevertheless, the emissions reductions resulting from implementation of the emissions reduction measures in this CAP would be substantial and would place the City of Manteca's total emissions level on a downward trajectory.

Emission forecasts used throughout this CAP Update are based on population growth estimates and the GHG Emissions Inventory. The data used within the CAP Update represents the most up-to-date sources of information for growth projections in the City of Manteca; however, it is uncertain the exact amount of growth that will be realized in future years, with the level of uncertainty increasing the farther into the future projections are focused.

As discussed above and in Chapter 5 of this CAP Update, based on projections for development within the City of Manteca, the City of Manteca is anticipated to comply with State emissions reductions goals by the year 2030. However, looking past the year 2030, growth trends within the City of Manteca increase in uncertainty, due to deviations from modeling and the City of Manteca potentially adopting updates to the existing General Plan, which could restrict or increase growth within the City limits. Therefore, this CAP Update provides a useful outlook into future emissions within the City of Manteca, but there is a significant need for continual updates to this CAP Update to ensure that the growth projections and emissions forecasts remain reliable and accurate. Nevertheless, the fact that the City of Manteca will achieve the 2030 emissions reductions goals, as long as the CAP Update measures are implemented as outlined, provides a strong indication that the City of Manteca will reduce GHG emissions in compliance with the State's requirements.

Considering the uncertainty surrounding the rate of future growth within the City of Manteca and the potential for future regulations to place further requirements on development within the City of Manteca, future updates to this CAP Update will be necessary in order to ensure that the emissions goals and emissions reduction measures keep pace with growth within the City of

Manteca and the evolving regulatory environment. Additionally, new technologies may become available in the future, the incorporation of which could provide new methodologies and routes to reducing GHG emissions within the City. Therefore, the City of Manteca shall seek to update the CAP at least once within each five-year period beginning in the year 2030. The City may also choose to amend the CAP more frequently than every five years, as new information becomes available, or where changes are necessary to respond to major legislative or regulatory requirements. Updating the City of Manteca's CAP on the foregoing schedule would ensure that the City of Manteca is able to adapt the CAP to any changes in the regulatory environment and incorporate updated methodologies or approaches to emissions control technologies. Furthermore, future updates to the CAP shall include updated emissions inventories. Updated emissions inventories will act to continually monitor Citywide emissions and inform decision makers with regard to the efficacy of reduction measures contained within this CAP Update or the need for new reduction measures. Specific areas of focus for future GHG inventories could include greater specificity regarding the amount of high global warming potential (GWP) gases emitted in the City, finer scale attribution of energy consumption between different economic sectors (e.g. industrial, residential, commercial), refined emissions estimates related to water and wastewater utilities, and more precise attribution of vehicle use and miles travelled between different economic sectors.

Prior to updating any portions of the CAP, the City of Manteca shall pursue implementation of the emissions reduction measures and development thresholds laid out within this CAP Update. Section 7.2 provides further discussion related to the implementation of the CAP emissions reduction measures.

#### **Sustainability Webpage**

To aid in the implementation of the emissions reduction measures, the City of Manteca shall create a specific page on the City's website that describes the City's sustainability efforts, identifies partnerships, and provides educational resources and opportunities for community members. The site will also serve as a clearinghouse for information on the City of Manteca's CAP progress and future updates.

#### 7.2 IMPLEMENTATION OF REDUCTION MEASURES

Chapter 6, Emissions Reduction Measures, of this CAP Update presents various information related to specific measures designed to aid the City of Manteca in reducing present and future GHG emissions. Each emissions reduction measure presented in Chapter 6 includes specific actions to be taken, as well as an identification of the party or parties responsible for the measure's implementation.

As noted in Chapter 6, some of the emissions reduction measures would be implemented through municipal actions, while other strategies would be implemented by private developers within the City of Manteca, under the guidance and direction of City staff. For instance, Transportation Measure TR.6 requires that any new government facilities include EV charging stations, while also requiring that the City of Manteca's Municipal Code be updated to include requirements for new developments within the City to include installation of EV charging stations and infrastructure. To assist developers in determining which reduction measures must be implemented within private developments in the City of Manteca, a Draft Sustainability Checklist has been prepared to be used during the review of future project proposals. The Draft Sustainability Checklist includes a succinct list of measures required to be implemented by future development, which

ensures that future development complies with the emissions reduction measures included in this CAP Update. The Draft Sustainability Checklist is included as Appendix B to this CAP Update.

The finalized sustainability checklist would be implemented during the City's development review process for all new development proposals within the City of Manteca. Development requirements within the draft sustainability checklist adapt the emissions reduction measures presented in Chapter 6 for all types of new development within the City of Manteca, including reuse of existing developments, infill development, and new development in currently undeveloped portions of the City of Manteca. Completion of the finalized sustainability checklist will be a requirement of the City of Manteca's development approval process for all proposed developments within the City of Manteca in the future.

In addition to the use of the finalized sustainability checklist during the development review process, City Staff Reports will also include a CAP Consistency section, which will relate a project's consistency to the City's CAP to decision makers and the public. The inclusion of a CAP Consistency section in all Staff Reports would ensure that all City actions, including those not required to complete a sustainability checklist, would be assessed for compliance with the City's CAP Update.

#### 7.3 FUNDING

Using this CAP Update as a starting block, the City will be able to pursue funding through various federal, State, and regional programs that fund GHG emission reducing activities and measures. The City will continually identify and adjust the constituents in which to fund and finance CAP Updates. Examples include the following:

- Federal Institutions;
- Regional Institutions;
- State Institutions;
- Building developers:
- Property and Business Owners;
- Private Institutions;
- Public Institutions;
- Utility Providers; and
- Taxpayers.

For instance, the State's Cap-and-Trade program for GHG emissions creates annual auction proceeds that are directed into various programs aimed at reducing GHG emissions on a local and Statewide basis. Such programs include the California Strategic Growth Council's Sustainable Agricultural Lands Conservation Program discussed in Land Use Measure LU.4. The Sustainable Agricultural Lands Conservation Program provides grant funding for planning projects and conservation easements that protect economically viable at-risk agricultural lands. In addition, programs such as the California Air Resources Board's Low Carbon Transportation Investments and Air Quality Improvement Plan exist to support the deployment of advanced technology and clean transportation in the light- and heavy-duty vehicle sectors. Moreover, the City may choose to pursue individual programs such as the Community Solar Pilot Program, funding for urban forestry through the California Department of Forestry and Fire Protection, or other programs.

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**ATTACHMENT 5** 

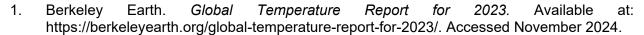
The California Environmental Protection Agency (CalEPA) maintains a database of available funding opportunities through the CoolCalifornia.org program. Through the CoolCalifornia.org program, the CalEPA promulgates best practices for emissions reductions, examples of such emissions reduction's practices, and funding sources. Through the continued distribution of Capand-Trade program funds and legislative action at the State level, diverse funding sources are anticipated to remain available into the foreseeable future.

The CAP Update may also provide a basis for the City to pursue funding for climate change resiliency programs. Based on the anticipated regional effects of climate change, such programs may include increasing the availability of cooling centers during summer months, supporting urban forestry, increasing flood protection, and/or protecting regional groundwater supplies.

## 8. REFERENCES

#### **EXHIBIT A**

## 7. REFERENCES



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All photos used throughout this CAP were either: (1) sourced and designed from Freepix; or (2) sourced from The Manteca Bulletin.

## APPENDIX B

## **Appendix B - GHG Quantification**

Table 1 Manteca Existing and Projected Population				
Year	2020	2030	2045	
Population 83,498 114,934 165,302				
Sources: Population Forecast for Manteca. November 2024; Clearpath, 2025.				

Table 2			
GOALS MEASURES 2030 Reductions 2045 Reductions			
GOALS	MEASURES	2030 Reductions	2045 Reductions
	Transporta	ation (IK)	
Promote Alternative Transportation	TR.3: Increase Use of Alternative Transportation TR.4: Promote Alternative Transportation Through Updated Parking Standards	TR.3: 1,216 MTCO2 <sub>e</sub> TR.4: 22,287 MTCO2 <sub>e</sub>	TR.3: 1,330 MTCO2 <sub>e</sub> TR.4: 71,011 MTCO2 <sub>e</sub>
Implement Electric Vehicle Infrastructure	TR.5: Optimize City Fleet TR.6: Support Electric Vehicle Adoption, Charging Infrastructure, and Alternative Fuels.	TR.5: 567 MTCO2 <sub>e</sub> TR.6: 66,863 MTCO2 <sub>e</sub>	TR.5: 1,815 MTCO2 <sub>e</sub> TR.6: 213,034 MTCO2 <sub>e</sub>
Work to Increase Active Mobility	TR.1: Bicycle and Pedestrian Infrastructure Improvement TR.9: Safe Routes to School	TR.1: 46 MTCO2 <sub>e</sub> TR.9: 28 MTCO2 <sub>e</sub>	TR.1: 148 MTCO2 <sub>e</sub> TR.9: 89 MTCO2 <sub>e</sub>
Reduce Single Occupant Vehicle Use and Emissions	TR.2: Congestion Management TR.7: Establish a Transportation Management Association TR.8: Mobile and Area Source Emissions Reductions	TR.2: 44,575 MTCO2e TR.7: 730 MTCO2e TR.8: 10,472 MTCO2e	TR.2: 142,022 MTCO2 <sub>e</sub> TR.7: 798 MTCO2 <sub>e</sub> TR.8: 31,417 MTCO2 <sub>e</sub>
	Land Us	se (LU)	
Encourage Sustainable Growth	LU.1: Encourage Adaptive Reuse LU.2: Comply with State Affordable Housing Requirements LU.3: Sustainable Growth of New Development LU.4: Urban Tree Management Plan	LU.1: 504 MTCO2e LU.2: Supportive LU.3: 1,512 MTCO2e LU.4: Supportive	LU.1: 1,605 MTCO2 <sub>e</sub> LU.2: Supportive LU.3: 4,816 MTCO2 <sub>e</sub> LU.4: Supportive
Energy and Building Design (EG)			
Expand Renewable Energy	EG.1: Renewable Energy Production Plan EG.3: Renewable Energy Requirement for Private Development EG.4: Participate in Energy Programs	EG.1: 1,498 MTCO2 <sub>e</sub> EG.3: 11,070 MTCO2 <sub>e</sub> EG.4: 528 MTCO2 <sub>e</sub>	EG.1: 8,025 MTCO2 <sub>e</sub> EG.3: 38,747 MTCO2 <sub>e</sub> EG.4: 1,711 MTCO2 <sub>e</sub>

Increase Lighting Efficiency	EG.8: Improve Lighting Efficiency	EG.8: 84 MTCO2e	EG.8: 169 MTCO2 <sub>e</sub>
Improve Building Design	EG.2: Resource Efficiency Improvements for City Buildings EG.5: Enforce CALGreen EG.6: Energy Efficient Design EG.7: Efficient Design of City Structures	EG.2: 9 MTCO2 <sub>e</sub> EG.5: 3,194 MTCO2 <sub>e</sub> EG.6: 17,613 MTCO2 <sub>e</sub> EG.7: 10,902 MTCO2 <sub>e</sub>	EG.2: 27 MTCO2 <sub>e</sub> EG.5: 11,180 MTCO2 <sub>e</sub> EG.6: 61,390 MTCO2 <sub>e</sub> EG.7: 38,149 MTCO2 <sub>e</sub>
	Water Conse	rvation (WC)	
Increase Water Efficiency	WC.1: Community Wide Water Use Efficiency WC.2: Water Efficient Landscape WC.3: Sustainable Water Service	WC.1: 212 MTCO2 <sub>e</sub> WC.2: 91 MTCO2 <sub>e</sub> WC.3: 220 MTCO2 <sub>e</sub>	WC.1: 585 MTCO2 <sub>e</sub> WC.2: 91 MTCO2 <sub>e</sub> WC.3: 606 MTCO2 <sub>e</sub>
	Solid Waste Mai	nagement (SW)	
Increased Waste Diversion	SW.1: Expand Municipal Recycling Program SW.2: Expand Yard Waste and Other Organics Composting SW.3: Improve Waste Management Practices.	SW.1: 33 MTCO2 <sub>e</sub> SW.2: 9,754 MTCO2 <sub>e</sub> SW.3: 8,978 MTCO2 <sub>e</sub>	SW.1: 115 MTCO2 <sub>e</sub> SW.2: 34,758 MTCO2 <sub>e</sub> SW.3: 26,752 MTCO2 <sub>e</sub>

2020 Community Baseline Inventory	MTCO2e
Residential Energy	65271.61159
Commercial Energy	33714.76773
Transportation & Mobile Sources	523214.8178
Solid Waste	56157.33209
Process & Fugitive Emissions	45578
Water & Wastewater	1295.606086

2030 Community Forecast	MTCO2e
Residential Energy	69395.05667
Commercial Energy	25278.99309
Transportation & Mobile Sources	522007.8305
Solid Waste	74179.49529
Process & Fugitive Emissions	60205.01527
Water & Wastewater	1283.548451

2045 Community Forecast	MTCO2e
Residential Energy	84350.02155
Commercial Energy	11218.03809
Transportation & Mobile Sources	484097.6572
Solid Waste	112615.9706
Process & Fugitive Emissions	91400.54411
Water & Wastewater	1948.623662

2020 Government Baseline Inventory	MTCO2e
Buildings & Facilities	786.09283
Street Lights & Traffic Signals	144
Vehicle Fleet	2704.6946
Transit Fleet	332
Employee Commute	792
Solid Waste Facilities	202.33984
Water & Wastewater Treatment Facilities	1304.0007

2030 Government Forecast	MTCO2e
Buildings & Facilities	841.56698
Street Lights & Traffic Signals	108.83101
Vehicle Fleet	2069.4322
Transit Fleet	321.64818
Employee Commute	728.1016
Solid Waste Facilities	181.07419
Water & Wastewater Treatment Facilities	1309.893

2045 Government Forecast	MTCO2e
Buildings & Facilities	1153.0645
Street Lights & Traffic Signals	153.28275
Vehicle Fleet	1820.0482
Transit Fleet	414.28602
Employee Commute	912.59446
Solid Waste Facilities	140.99685
Water & Wastewater Treatment Facilities	1988.6188

Transportation 523,215
Residential Energy 65,272
Commerical Energy 33,715
Solid Waste 56,157
Process & Fugitive Emissions 45,578
Total 730,202

MTCO2e

2020 Total Emissions Inventory

Calculation Sector Numbers	MTCO2e
Transportation	527043.5123
Land Use	527043.5123
Energy and Building Design	99916.47215
Water Conservation	1304.000744
Solid Waste Management	56359.67193
	1211667.169

Total 2030 Calculation Sector Numbers	MTCO2e
Transportation	525127.0125
Land Use	525127.0125
Energy and Building Design	94674.046
Water Conservation	1309.892967
Solid Waste Management	74360.56948

Total 2045 Calculation Sector Numbers	MTCO2e
Transportation	487244.5859
Land Use	487244.5859
Energy and Building Design	95568.059
Water Conservation	1988.618785
Solid Waste Management	112756.9675

#### Calculations

Calculations			
Transportation	Energy	Water Conservation	Solid Waste
523214.8178	65271.61159		202.3398383
2704.694567	33714.76773		56157.33209
332	786.0928317		56359.67193
792	144		
527043.5123	99916.47215		
522007.8305	53648.03877		181.0741907
2069.432248	25278.99309		74179.49529
321.6481822	841.5669782		<b>74360.56948</b>
0			74360.36946
728.1016006	108.8310068		
525127.0125	79877.42985		
484097.6572	29235.45425		112615.9706
1820.048234	11218.04		140.9968499
414.2860178	1153.064511		112756.9675
912.5944603	153.2827471		
487244.5859	41759.84151		

CNG Fuel Production Reduction = (negative 1090.7) negative 106824 Gallons Diesel

ClearPath Measures	Sector	2030 Sector MTCO2e 203	30 Measure MTCO2e Split Amounts
TR.1: Bicycle and Pedestrian Infrastructure Improvement & TR.9: Safe Routes to School	Transportation	525127.0125	74.23860332 TR.1=46.399 TR.9=27.839 (5/8 & 3/8)
(Diesel) TR.6: Support Electric Vehicle Charging Infrastructure & TR.4: Promote Alternative Transportation Through Updated Parking Standards & TR.2: Congestion Management	Transportation	525127.0125	22999.41677 TR.2=7,666.472 TR.4=3,833.236 TR.6=11,499.708 (2/6 & 1/6 & 3/6)
(GAS) TR.6: Support Electric Vehicle Charging Infrastructure & TR.4: Promote Alternative Transportation Through Updated Parking Standards & TR.2: Congestion Management	Transportation	525127.0125	110728.2027 TR.2=36,909.4 TR.4=18,454.7 TR.6= 55,364.1 (2/6 & 1/6 & 3/6)
TR.8: Mobile Source Emissions Reductions (Engine Tiers Construction and AG)	Transportation	525127.0125	3,161.16 TR.8= 3,161.16
TR.8: Mobile Source Emissions Reductions (Electric landscaping)	Transportation	525127.0125	7,311.33 TR.8= 7,311.33
TR.3: Increase Use of Alternative Transportation & TR.7: Establish a Transportation Management Association	Transportation	525127.0125	1945.539076 TR.3=1,215.9619 TR.7=729.577 (1/2 &1/2)
TR.5: Optimize City Fleet 1/2	Transportation	525127.0125	437.9391975 TR.5= 437.939
TR.5: Optimize City Fleet 2/2	Transportation	525127.0125	129.093038 TR.5= 129.093
LU.1: Encourage Adaptive Reuse & LU.3: Sustainable Growth of New Development	Land Use	525127.0125	2015.628648 LU.1=503.907 LU.3= 1,511.721 (1/4 & 3/4)
EG.2: Resource Efficiency Improvements for City Buildings	Energy (Commerical)	94,674.05	0.207487031 EG.2= 0.207487031487594
EG.5: Enforce CALGreen	Energy (Commerical)	94,674.05	3194.324405 EG.5= 3194.32440519925
EG.3: Renewable Energy Requirement for Private Development	Energy (Commerical)	94,674.05	11070.768 EG.3= 11070.76819925
EG.7: Efficient Design of City Structures	Energy (Commerical)	94,674.05	10902.18452 EG.7= 10902.1845219925
EG.6: Energy Efficient Design	Energy (Commerical)	94,674.05	16634.05591 EG.6= 16634.0559119925
EG.1: Renewable Energy Production Plan & EG.6: Energy Efficient Design	Energy (Commerical)	94,674.05	1957.213865 EG.1=978.6069 EG.6= 978.6069 (1/2 &1/2)
EG.1: Renewable Energy Production Plan & EG.4: Participate in Energy Programs	Energy (Commerical)	94,674.05	1039.966167 EG.1=519.983 EG.4=519.983 (1/2 &1/2)
EG.2: Resource Efficiency Improvements for City Buildings & EG.4: Participate in Energy Programs	Energy (Commerical)	94,674.05	17.20589692 EG.2= 8.602945 EG.4= 8.602945 (1/2 &1/2)
EG.8: Improve Lighting Efficiency	Energy (Commerical)	94,674.05	83.64743181 EG.8= 83.6474318119925
WC.1: Community Wide Water Use Efficiency	Wastewater	1309.892967	212.3591434 WC.1= 212.359143440611
WC.3: Sustainable Water Service	Wastewater	1309.892967	220.2112565 WC.3= 220.211256483737
WC.2: Water Efficient Landscape	Wastewater	1309.892967	91.41197132 WC.2= 91.4119713176678
SW.3: Improve Waste Management Practices	Solid Waste	74360.56948	8978.482258 SW.3= 8978.48225772343
SW.2: Expand Yard Waste and Other Organics Composting	Solid Waste	74360.56948	9743.038336 SW.2= 9743.03833645894
SW.1:Expand Municipal Recycling Program & SW.2: Expand Yard Waste and Other Organics Composting	Solid Waste	74360.56948	43.61816874 SW.1= 32.7135 SW.2= 10.90

CAP Measures	Measure MTCO2e	Final MTCO2e Reductions	Sector MTCO2e	Percentage of Sector Reduction	
TR.1: Bicycle and Pedestrian Infrastructure Improvement	46.399	46.399	522007.8305	-	0.008888564
TR.2: Congestion Management	7666.472+36,909.4	44,575.87	522007.8305		8.539310599
TR.3: Increase Use of Alternative Transportation	1,215.96	1,215.96	522007.8305		0.232939398
TR.4: Promote Alternative Transportation Through Updated Parking Standards	18,454.7+3833.236	22,287.94	522007.8305		4.269656258
TR.5: Optimize City Fleet	129.093+437.939	567.03	3119.182031		18.17880439
TR.6: Support Electric Vehicle Charging Infrastructure	55,364.1+11499.708	66,863.71	522007.8305		12.8089477
TR.7: Establish a Transportation Management Association	729.577	729.577	522007.8305		0.139763612
TR.8: Mobile Source Emissions Reductions	3,161.16 + 7,311.33	10,472.49	522007.8305		2.006194618
TR.9: Safe Routes to School	27.839	27.839	522007.8305		0.005333062
LU.1: Encourage Adaptive Reuse	503.907	503.91	522007.8305		0.096533035
LU.2: Comply with State Affordable Housing Requirements	Supportive	C	522007.8305		0
LU.3: Sustainable Growth of New Development	1,511.72	1511.72	2 522007.8305		0.289597188
LU.4: Urban Tree Management Plan	Supportive	C	522007.8305		0
EG.1: Renewable Energy Production Plan	519.983+978.6069	1,498.59	94,674.05		1.582894218
EG.2: Resource Efficiency Improvements for City Buildings	8.602945+0.207487	8.81	950.397985		0.92698008
EG.3: Renewable Energy Requirement for Private Development	11070.7682	11070.77	94,674.05		11.69356383
EG.4: Participate in Energy Programs	8.602945+519.983	528.58	94,674.05		0.558315634
EG.5: Enforce CALGreen	3194.324405	3194.32	94,674.05		3.374018683
EG.6: Energy Efficient Design	978.6069+16634.0559	17,612.67	94,674.05		18.60348294
EG.7: Efficient Design of City Structures	10902.18452	10902.18	94,674.05		11.51548968
EG.8: Improve Lighting Efficiency	83.64743181	83.65	950.397985		8.801575899
WC.1: Community Wide Water Use Efficiency	212.3591434	212.36	1309.892967		16.21201162
WC.2: Water Efficient Landscape	91.41197132	91.41	1309.892967		6.978432767
WC.3: Sustainable Water Service	220.2112565	220.21	1309.892967		16.81129723
SW.1: Expand Municipal Recycling Program	32.7135	32.71	74360.56948		0.043988367
SW.2: Expand Yard Waste and Other Organics Composting	9743.0383+10.90	9,753.93	74360.56948		13.11707276
SW.3: Improve Waste Management Practices.	8978.4822	8978.48	74360.56948		12.07424857

29.39997073

4.596756905

30.48705316

0.101536963

30.82519656

23.7250678

ClearPath Measures	Sector 20	2030 Sector MTCO 2030 N	Measure MTCO2e Split Ratios	_
TR.1: Bicycle and Pedestrian Infrastructure Improvement & TR.9: Safe Routes to School	Transportation	487244.5859	236.5311103 TR.1=148.125 TR.9=88.875 (5/8 & 3/8)	
(Diesel) TR.6: Support Electric Vehicle Charging Infrastructure & TR.4: Promote Alternative Transportation Through Updated Parking Standards & TR.2: Congestion Management	Transportation	487244.5859	73278.28569 TR.2=24,426.09 TR.4=12,213.04 TR.6=36,639.14 (2	(2/6 & 1/6 & 3/6)
(GAS) TR.6: Support Electric Vehicle Charging Infrastructure & TR.4: Promote Alternative Transportation Through Updated Parking Standards & TR.2: Congestion Management	Transportation	487244.5859	352790.3751 TR.2=117,596.79 TR.4=58,798.39 TR.6= 176,395.18	18 (2/6 & 1/6 & 3/6)
TR.8: Mobile Source Emissions Reductions (Engine Tiers Construction and AG)	Transportation	487244.5859	9483.5 TR.8= 9483.5	`
TR.8: Mobile Source Emissions Reductions (Electric landscaping)	Transportation	487244.5859	21934 TR.8= 21934	
TR.3: Increase Use of Alternative Transportation & TR.7: Establish a Transportation Management Association	Transportation	487244.5859	2128.484374 TR.3=1,330.3125 TR.7=798.1875 (5/8 & 3/8)	
TR.5: Optimize City Fleet 1/2	Transportation	487244.5859	1395.315105 TR.5= 1395.3151	
TR.5: Optimize City Fleet 2/2	Transportation	487244.5859	419.7327714 TR.5= 419.73277	
LU.1: Encourage Adaptive Reuse & LU.3: Sustainable Growth of New Development	Land Use	487244.5859	6421.980757 LU.1=1,605.49 LU.3= 4,816.48 (1/4 & 3/4)	
EG.2: Resource Efficiency Improvements for City Buildings	Energy (Commerical)	95,568.06	0.207487031 EG.2= 0.207487031487594	
EG.5: Enforce CALGreen	Energy (Commerical)	95,568.06	11180.13542 EG.5= 11180.1354181973	
EG.3: Renewable Energy Requirement for Private Development	Energy (Commerical)	95,568.06	38747.6908 EG.3= 38747.6907960349	
EG.7: Efficient Design of City Structures	Energy (Commerical)	95,568.06	38149.00303 EG.7= 38149.003026237	
EG.6: Energy Efficient Design	Energy (Commerical)	95,568.06	58219.19567 EG.6= 58219.1956	
EG.1: Renewable Energy Production Plan & EG.6: Energy Efficient Design	Energy (Commerical)	95,568.06	6340.767801 EG.1=3,170.38 EG.6= 3,170.38 (1/2 &1/2)	
EG.1: Renewable Energy Production Plan & EG.4: Participate in Energy Programs	Energy (Commerical)	95,568.06	3369.168851 EG.1=1,684.58 EG.4=1,684.58 (1/2 &1/2)	
EG.2: Resource Efficiency Improvements for City Buildings & EG.4: Participate in Energy Programs	Energy (Commerical)	95,568.06	53.17272888 EG.2=26.58 EG.4= 26.58 (1/2 &1/2)	
EG.8: Improve Lighting Efficiency	Energy (Commerical)	41759.84151	169.23 EG.8= 83.6474318119925	
WC.1: Community Wide Water Use Efficiency	Wastewater	1988.618785	584.6533407 WC.1= 584.6533407	
WC.3: Sustainable Water Service	Wastewater	1988.618785	606.2712661 WC.3= 606.271266	
WC.2: Water Efficient Landscape	Wastewater	1988.618785	91.41197132 WC.2= 91.4119713176	
SW.3: Improve Waste Management Practices	Solid Waste	112756.9675	26751.66698 SW.3= 26751.66698	
SW.2: Expand Yard Waste and Other Organics Composting	Solid Waste	112756.9675	34757.55685 SW.2= 34757.556852330	
SW.1:Expand Municipal Recycling Program & SW.2: Expand Yard Waste and Other Organics Composting	Solid Waste	112756.9675	152.6635906 SW.1=114.49 SW.2= 38.16589	
CAP Measures		Final MTCO2e Red Sector	<b>G</b>	
TR.1: Bicycle and Pedestrian Infrastructure Improvement	148.125	148.13	487244.5859	0.030401569
TR.2: Congestion Management	24,426.09+117,596.79	142,022.88	487244.5859	29.14816996
TR.3: Increase Use of Alternative Transportation	1,330.31	1,330.31	487244.5859	0.27302766
TR.4: Promote Alternative Transportation Through Updated Parking Standards	12,213.04 +58,798.39	71,011.43	487244.5859	14.5740829
TR.5: Optimize City Fleet	1395.3151+419.73277	1,815.04	2387.616999	76.0188925
TR.6: Support Electric Vehicle Charging Infrastructure	36,639.14+176,395.18	213,034.32	487244.5859	43.7222549
TR.7: Establish a Transportation Management Association	798.19	798.19	487244.5859	0.16381659
TR.8: Mobile Source Emissions Reductions	9483.5 + 21934	31,417.50	487244.5859	6.44799365
TR.9: Safe Routes to School	88.875	88.88	487244.5859	0.01824135
LU.1: Encourage Adaptive Reuse	1,605.49	1,605.49	487244.5859	0.32950391
LU.2: Comply with State Affordable Housing Requirements	Supportive	0	487244.5859	
LU.3: Sustainable Growth of New Development	4,816.48	4,816.48	487244.5859	0.98851380
LU.4: Urban Tree Management Plan	Supportive	0	487244.5859	
EG.1: Renewable Energy Production Plan	6340.767+1,684.58	8,025.34	95,568.06	8.3975128
EG.2: Resource Efficiency Improvements for City Buildings	26.58 +0.207487	26.78	1,306.35	2.04999090
EG.3: Renewable Energy Requirement for Private Development	38747.6908	38747.6908	95,568.06	40.544603
	1,684.58+26.58	1,711.16	95,568.06	1.7905145
EG.4: Participate in Energy Programs		44400 40544	95,568.06	11.698610
EG.4: Participate in Energy Programs EG.5: Enforce CALGreen	11180.13541	11180.13541	·	
EG.4: Participate in Energy Programs EG.5: Enforce CALGreen EG.6: Energy Efficient Design	3,170.38+58219.1956	61,389.57	95,568.06	64.236493
EG.4: Participate in Energy Programs EG.5: Enforce CALGreen			·	64.236493 39.918151

584.6533407

91.41197132

606.2712661

34757.55685

26751.66698

114.49

584.6533407

91.41197132

606.2712661

34757.55685

26751.66698

114.49

1988.618785

1988.618785

1988.618785

112756.9675

112756.9675

112756.9675

WC.1: Community Wide Water Use Efficiency

SW.1: Expand Municipal Recycling Program

SW.3: Improve Waste Management Practices.

SW.2: Expand Yard Waste and Other Organics Composting

WC.2: Water Efficient Landscape

WC.3: Sustainable Water Service

Sector	Sub_sector
Stationary Energy	Residential
Stationary Energy	Residential
Stationary Energy	Commercial
Transportation	On-Road
Transportation	On-Road
Transportation	On-Road
Transportation	Off-road
Transportation	Off-road
Waste	Solid waste disposal
Waste	Wastewater

#### **EXHIBIT A**

#### **ATTACHMENT 5**

#### Inventory\_record

2020 Baseline Residential Energy Inventory Electricity Usage

2020 Baseline Residential Energy Inventory Natural Gas Usage

2020 Baseline DA Electrical Use

2020 Baseline Commercial Natural Gas Usage

2020 Baseline Commercial Electricity Usage

2020 Baseline Commercial Electricity (County and Special Districts)

2020 Baseline Commercial Natural Gas Usage (County and Special Districts and possibly industrial)

2020 Baseline Community Transportation & Mobile Sources (2019 VMT from GPU) Natural Gas

2020 Baseline Community Transportation & Mobile Sources (2019 VMT from GPU) Diesel

2020 Baseline Community Transportation & Mobile Sources (2019 VMT from GPU) Gasoline

2020 Baseline Community Transportation & Mobile Source Off-road equipment use (Ag)

2020 Baseline Community Transportation & Mobile Source Off-road equipment (construction)

2020 Baseline Community Solid Waste Generation

2020 Baseline WWTP Digester Gas Combustion

2020 Baseline Government Operations Process N2O

2020 Baseline WWTP Process N2O from Effluent Discharge

2020 Baseline Government Operations WWTP Flaring

#### **EXHIBIT A**

#### **ATTACHMENT 5**

category.calculator	Fuel Type
Emissions from Grid Electricity (USCP Required)	
Emissions from Stationary Fuel Combustion (USCP Required)	Natural Gas
Emissions from Grid Electricity (USCP Required)	
Emissions from Stationary Fuel Combustion (USCP Required)	Natural Gas
Emissions from Grid Electricity (USCP Required)	
Emissions from Grid Electricity (USCP Required)	
Emissions from Stationary Fuel Combustion (USCP Required)	Natural Gas
On Road Transportation (USCP Required)	CNG
On Road Transportation (USCP Required)	Diesel
On Road Transportation (USCP Required)	Gasoline
Emissions from Off Road Vehicles (USCP Recommended)	Diesel
Emissions from Off Road Vehicles (USCP Recommended)	Diesel
Landfilled Waste (Obsolete)	
Emissions from the Combustion of Digester Gas (USCP Recommended, where applicab	le)
Process N2O Emissions from Wastewater Treatment (USCP Recommended)	
Process N2O from Effluent Discharge to River, Ocean, or Deep Well Injection	
Emissions from Flaring of Digester Gas (USCP Recommended, where applicable)	

### **ATTACHMENT 5**

Activity Name	<b>Activity Data</b>	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)
Electricity Energy Equivalent (MMBtu)	629357.6997	13382.92419	2.17472426	0.25093	13510.313
Energy Equivalent (MMBtu)	973203.7	51599.26017	4.8660185	0.09732	51761.299
Electricity Energy Equivalent (MMBtu)	114376.1229	2432.141503	0.39522283	0.045603	2455.2925
Energy Equivalent (MMBtu)	223891.7	11870.73793	1.1194585	0.022389	11908.016
Electricity Energy Equivalent (MMBtu)	426897.041	9077.716439	1.4751283	0.170207	9164.125
Electricity Energy Equivalent (MMBtu)	19878.26962	422.6998026	0.06868869	0.007926	426.72338
Energy Equivalent (MMBtu)	183516.7	9730.055434	0.9175835	0.018352	9760.611
On Road VMT	716641	0	1.40891621	0.125412	72.68388
On Road VMT	70751968	110229.503	0.39116358	16.22694	114540.59
On Road VMT	569729247	374851.4387	4.43308834	5.630839	376467.74
		20033.05121	2.82542544	0.510146	20247.352
		11788.14949	0.66965002	0.300188	11886.449
Waste Generated (wet tons)	92698.25		2005.619		56157.332
Energy Equivalent (MMBtu)	34844.2656		0.11150165	0.021952	8.9392963
Process N2O Population Served	91527			0.800861	212.22823
Daily N Load at Facility with Release to Environment (kg N/day)	90.64			0.259884	68.869297
Annual Digester Gas Flared (scf / year)	22639290.75		2.75689737		77.193126

#### **EXHIBIT A**

### **ATTACHMENT 5**

CO2 Emissions Factor	CO2 Emissions F	CH4 Emissi	CH4 Emissions Factor Units	N2O Emissions Factor	N2O Emissions Factor Units	GPC
0.021264416	MT/MMBtu	3.46E-06	MT/MMBtu	3.99E-07	MT/MMBtu	I.1.2
53.02	kg/MMBtu	0.005	kg/MMBtu	0.0001	kg/MMBtu	l.1.1
0.021264416	MT/MMBtu	3.46E-06	MT/MMBtu	3.99E-07	MT/MMBtu	1.2.2
	kg/MMBtu		kg/MMBtu		kg/MMBtu	1.2.1
0.021264416	MT/MMBtu	3.46E-06	MT/MMBtu	3.99E-07	MT/MMBtu	1.2.2
0.021264416	MT/MMBtu	3.46E-06	MT/MMBtu	3.99E-07	MT/MMBtu	1.2.2
	kg/MMBtu		kg/MMBtu		kg/MMBtu	1.2.1
0.052529183	MT/MMBtu	1.97E-06	MT/mile	1.75E-07	MT/mile	II.1.1
0.073934483	MT/MMBtu	5.53E-09	MT/mile	2.29E-07	MT/mile	II.1.1
0.07024	MT/MMBtu	7.78E-09	MT/mile	9.88E-09	MT/mile	II.1.1
0.073964068	MT/MMBtu	1.04E-05	MT/MMBtu	1.88E-06	MT/MMBtu	II.5.1
0.073964068	MT/MMBtu	4.20E-06	MT/MMBtu	1.88E-06	MT/MMBtu	II.5.1
						III.1.2
					g/person	
					kg N2O/kg N in effluent	
		1.22E-07		4		

notes

PGE provided community data. Emission factors from PGE and eGRID 2020. Usage data was average 2018-2020 to account for pandemic swing. PGE data. 2018-2020 average natural gas usage.

Includes ag in average. Only included industrial in 2018 of the 3 year average (2018-2020).

This is additional kWh usage from the PGE community report for county and special districts operating in Manteca.

This is additional natural gas therms from the PGE community report for county and special districts operating in Manteca and industrial therms based on diffe

Offroad database fuel consumption 2020, % of Manteca population vs. SJ County population

Calculated from Offroad database. % of Manteca population to SJ County population.

rence in PGE community report and aggregate data provided.

Process & Fugitive Emissions

Year Usage CO2e Output Name

2020 45578 45578 HFC-134a - CO2e (MT)

2021 46864 46864 HFC-134a - CO2e (MT)

2022 48187 48187 HFC-134a - CO2e (MT)

2023 49547 49547 HFC-134a - CO2e (MT)

2024 50946 50946 HFC-134a - CO2e (MT) 2025 52383 52383 HFC-134a - CO2e (MT)

2026 53862 53862 HFC-134a - CO2e (MT)

2027 55382 55382 HFC-134a - CO2e (MT)

2028 56945 56945 HFC-134a - CO2e (MT)

2029 58552 58552 HFC-134a - CO2e (MT) 2030 60205 60205 HFC-134a - CO2e (MT)

2031 61904 61904 HFC-134a - CO2e (MT) 2032 63651 63651 HFC-134a - CO2e (MT)

2033 65448 65448 HFC-134a - CO2e (MT)

2034 67295 67295 HFC-134a - CO2e (MT)

2035 69194 69194 HFC-134a - CO2e (MT) 2036 71147 71147 HFC-134a - CO2e (MT)

2037 73155 73155 HFC-134a - CO2e (MT)

2038 75220 75220 HFC-134a - CO2e (MT)

2039 77343 77343 HFC-134a - CO2e (MT)

2040 79526 79526 HFC-134a - CO2e (MT)

2041 81771 81771 HFC-134a - CO2e (MT) 2042 84079 84079 HFC-134a - CO2e (MT)

2043 86452 86452 HFC-134a - CO2e (MT)

2044 88892 88892 HFC-134a - CO2e (MT)

2045 91401 91401 HFC-134a - CO2e (MT)

Residential Year Usage CO2e Output Name	Commerical Year Usage CO2e Output Name	Transportation Year Usage C	:O2e Output Name	Wastewater Year Usage CC	So D2e Output Name Ye
2020 629358 13510 Electricity Energy Equivalent (MMBtu) 2021 647121 13308 Electricity Energy Equivalent (MMBtu)	2020 561151 12046 Electricity Energy Equivalent (MMBtu) 2021 576989 11866 Electricity Energy Equivalent (MMBtu)	2020 569729247 2021 585809291	376468 Gasoline - On Road VMT 377029 Gasoline - On Road VMT	2020 22639291 2021 23278262	77 Annual Digester Gas Flared (scf / year) 79 Annual Digester Gas Flared (scf / year)
2022 665385 13109 Electricity Energy Equivalent (MMBtu)	2022 593274 11688 Electricity Energy Equivalent (MMBtu)	2022 602343178 2023 619343717	377591 Gasoline - On Road VMT 378153 Gasoline - On Road VMT	2021 23276262 2022 23935268 2023 24610817	82 Annual Digester Gas Flared (scf/year)
2024 703475 12720 Electricity Energy Equivalent (MMBtu)	2024 627236 11341 Electricity Energy Equivalent (MMBtu)	2024 636824081 2025 654797810	378133 Gasoline - On Road VMT 380449 Gasoline - On Road VMT	2023 24610617 2024 25305433 2025 26019654	84 Annual Digester Gas Flared (scf / year) 86 Annual Digester Gas Flared (scf / year) 89 Annual Digester Gas Flared (scf / year)
2026 743745 12342 Electricity Energy Equivalent (MMBtu)	2026 663142 11004 Electricity Energy Equivalent (MMBtu)	2026 673278829	382190 Gasoline - On Road VMT	2026 26754033	89 Annual Digester Gas Flared (scf / year) 91 Annual Digester Gas Flared (scf / year)  04 Annual Digester Gas Flared (scf / year)
2027 764736 12157 Electricity Energy Equivalent (MMBtu) 2028 786320 11975 Electricity Energy Equivalent (MMBtu)	2027 681859 10840 Electricity Energy Equivalent (MMBtu) 2028 701103 10678 Electricity Energy Equivalent (MMBtu)	2027 692281457 2028 711820416	383938 Gasoline - On Road VMT 385695 Gasoline - On Road VMT	2027 27509139 2028 28285557	94 Annual Digester Gas Flared (scf / year) 96 Annual Digester Gas Flared (scf / year)
2029 808513 11796 Electricity Energy Equivalent (MMBtu) 2030 831333 11620 Electricity Energy Equivalent (MMBtu)	2029 720891 10518 Electricity Energy Equivalent (MMBtu) 2030 741238 10360 Electricity Energy Equivalent (MMBtu)	2029 731910842 2030 752568301	387459 Gasoline - On Road VMT 392419 Gasoline - On Road VMT	2029 29083889 2030 29904753	99 Annual Digester Gas Flared (scf / year)  102 Annual Digester Gas Flared (scf / year)
2031 854796 11948 Electricity Energy Equivalent (MMBtu) 2032 878922 12285 Electricity Energy Equivalent (MMBtu)	2031 762158 10653 Electricity Energy Equivalent (MMBtu) 2032 783670 10954 Electricity Energy Equivalent (MMBtu)	2031 773808796 2032 795648783	397442 Gasoline - On Road VMT 402530 Gasoline - On Road VMT	2031 30748785 2032 31616639	<ul><li>105 Annual Digester Gas Flared (scf / year)</li><li>108 Annual Digester Gas Flared (scf / year)</li></ul>
2033 903729 12632 Electricity Energy Equivalent (MMBtu) 2034 929236 12988 Electricity Energy Equivalent (MMBtu)	2033 805788 11263 Electricity Energy Equivalent (MMBtu) 2034 828530 11581 Electricity Energy Equivalent (MMBtu)	2033 818105182 2034 841195390	407682 Gasoline - On Road VMT 412901 Gasoline - On Road VMT	2033 32508988 2034 33426522	111 Annual Digester Gas Flared (scf/year) 114 Annual Digester Gas Flared (scf/year)
2035 955463 13355 Electricity Energy Equivalent (MMBtu) 2036 982430 13732 Electricity Energy Equivalent (MMBtu)	2035 851915 11907 Electricity Energy Equivalent (MMBtu) 2036 875959 12244 Electricity Energy Equivalent (MMBtu)	2035 864937297 2036 889349296	421158 Gasoline - On Road VMT 429581 Gasoline - On Road VMT	2035 34369952 2036 35340010	<ul><li>117 Annual Digester Gas Flared (scf/year)</li><li>120 Annual Digester Gas Flared (scf/year)</li></ul>
2037 1010158 14119 Electricity Energy Equivalent (MMBtu) 2038 1038668 14518 Electricity Energy Equivalent (MMBtu)	2037 900682 12589 Electricity Energy Equivalent (MMBtu) 2038 926103 12944 Electricity Energy Equivalent (MMBtu)	2037 914450299 2038 940259753	438172 Gasoline - On Road VMT 446934 Gasoline - On Road VMT	2037 36337447 2038 37363035	<ul><li>124 Annual Digester Gas Flared (scf / year)</li><li>127 Annual Digester Gas Flared (scf / year)</li></ul>
2039 1067984 14928 Electricity Energy Equivalent (MMBtu) 2040 1098126 15349 Electricity Energy Equivalent (MMBtu)	2039 952242 13310 Electricity Energy Equivalent (MMBtu) 2040 979118 13685 Electricity Energy Equivalent (MMBtu)	2039 966797653 2040 994084559	455872 Gasoline - On Road VMT 467332 Gasoline - On Road VMT	2039 38417570 2040 39501868	131 Annual Digester Gas Flared (scf/year) 135 Annual Digester Gas Flared (scf/year)
2041 1129120 15782 Electricity Energy Equivalent (MMBtu) 2042 1160988 16227 Electricity Energy Equivalent (MMBtu)	2041 1006752 14072 Electricity Energy Equivalent (MMBtu) 2042 1035167 14469 Electricity Energy Equivalent (MMBtu)	2041 1022141611 2042 1050990546	479081 Gasoline - On Road VMT 491125 Gasoline - On Road VMT	2041 40616769 2042 41763137	138 Annual Digester Gas Flared (scf / year)  142 Annual Digester Gas Flared (scf / year)
2043 1193756 16685 Electricity Energy Equivalent (MMBtu) 2044 1227449 17156 Electricity Energy Equivalent (MMBtu)	2043 1064383 14877 Electricity Energy Equivalent (MMBtu) 2044 1094425 15297 Electricity Energy Equivalent (MMBtu)	2043 1080653713 2044 1111154094	503471 Gasoline - On Road VMT 516128 Gasoline - On Road VMT	2043 42941860 2044 44153852	146 Annual Digester Gas Flared (scf/year) 151 Annual Digester Gas Flared (scf/year)
2045 1262092 17641 Electricity Energy Equivalent (MMBtu) 2020 973204 51761 Natural Gas - Energy Equivalent (MMBtu)	2045 1125314 15729 Electricity Energy Equivalent (MMBtu) 2020 407408 21669 Natural Gas - Energy Equivalent (MMBtu)	2045 1142515318 2020 70751968	530165 Gasoline - On Road VMT 114541 Diesel - On Road VMT	2045 45400050 2020 52961250	155 Annual Digester Gas Flared (scf / year) 9 Annual Gas Production (scf / Year)
2021 1000671 53222 Natural Gas - Energy Equivalent (MMBtu) 2022 1028914 54724 Natural Gas - Energy Equivalent (MMBtu)	2021 418907 22280 Natural Gas - Energy Equivalent (MMBtu) 2022 430730 22909 Natural Gas - Energy Equivalent (MMBtu)	2021 72748872 2022 74802137	114711 Diesel - On Road VMT 114882 Diesel - On Road VMT	2021 54456029 2022 55992996	<ul><li>9 Annual Gas Production (scf / Year)</li><li>9 Annual Gas Production (scf / Year)</li></ul>
2023 1057954 56269 Natural Gas - Energy Equivalent (MMBtu) 2024 1087814 57857 Natural Gas - Energy Equivalent (MMBtu)	2023 442887 23556 Natural Gas - Energy Equivalent (MMBtu) 2024 455387 24220 Natural Gas - Energy Equivalent (MMBtu)	2023 76913353 2024 79084157	115053 Diesel - On Road VMT 115225 Diesel - On Road VMT	2023 57573343 2024 59198294	10 Annual Gas Production (scf / Year) 10 Annual Gas Production (scf / Year)
2025 1118517 59490 Natural Gas - Energy Equivalent (MMBtu) 2026 1150086 61169 Natural Gas - Energy Equivalent (MMBtu)	2025 468240 24904 Natural Gas - Energy Equivalent (MMBtu) 2026 481456 25607 Natural Gas - Energy Equivalent (MMBtu)	2025 81316229 2026 83611299	115752 Diesel - On Road VMT 116282 Diesel - On Road VMT	2025 60869107 2026 62587077	10 Annual Gas Production (scf / Year) 11 Annual Gas Production (scf / Year)
2027 1182546 62895 Natural Gas - Energy Equivalent (MMBtu) 2028 1215922 64671 Natural Gas - Energy Equivalent (MMBtu)	2027 495044 26330 Natural Gas - Energy Equivalent (MMBtu) 2028 509017 27073 Natural Gas - Energy Equivalent (MMBtu)	2027 85971145 2028 88397595	116814 Diesel - On Road VMT 117348 Diesel - On Road VMT	2027 64353536 2028 66169850	11 Annual Gas Production (scf / Year) 11 Annual Gas Production (scf / Year)
2029 1250240 66496 Natural Gas - Energy Equivalent (MMBtu) 2030 1285527 68373 Natural Gas - Energy Equivalent (MMBtu)	2029 523383 27837 Natural Gas - Energy Equivalent (MMBtu) 2030 538155 28623 Natural Gas - Energy Equivalent (MMBtu)	2029 90892530 2030 93457881	117885 Diesel - On Road VMT 119394 Diesel - On Road VMT	2029 68037429 2030 69957718	11 Annual Gas Production (scf / Year) 12 Annual Gas Production (scf / Year)
2031 1321810 70302 Natural Gas - Energy Equivalent (MMBtu) 2032 1359116 72287 Natural Gas - Energy Equivalent (MMBtu)	2031 553344 29430 Natural Gas - Energy Equivalent (MMBtu) 2032 568961 30261 Natural Gas - Energy Equivalent (MMBtu)	2031 96095637 2032 98807842	120922 Diesel - On Road VMT 122470 Diesel - On Road VMT	2031 71932205 2032 73962420	12 Annual Gas Production (scf / Year) 12 Annual Gas Production (scf / Year)
2033 1397476 74327 Natural Gas - Energy Equivalent (MMBtu) 2034 1436918 76425 Natural Gas - Energy Equivalent (MMBtu)	<ul> <li>2033 585020 31115 Natural Gas - Energy Equivalent (MMBtu)</li> <li>2034 601531 31993 Natural Gas - Energy Equivalent (MMBtu)</li> </ul>	20331015965952034104464058	124038 Diesel - On Road VMT 125625 Diesel - On Road VMT	2033 76049936 2034 78196371	<ul><li>13 Annual Gas Production (scf / Year)</li><li>13 Annual Gas Production (scf / Year)</li></ul>
2035 1477474 78582 Natural Gas - Energy Equivalent (MMBtu) 2036 1519174 80800 Natural Gas - Energy Equivalent (MMBtu)	2035 618509 32896 Natural Gas - Energy Equivalent (MMBtu) 2036 635966 33825 Natural Gas - Energy Equivalent (MMBtu)	20351074124532036110444063	128138 Diesel - On Road VMT 130700 Diesel - On Road VMT	2035 80403386 2036 82672692	<ul><li>14 Annual Gas Production (scf / Year)</li><li>14 Annual Gas Production (scf / Year)</li></ul>
2037 1562051 83080 Natural Gas - Energy Equivalent (MMBtu) 2038 1606139 85425 Natural Gas - Energy Equivalent (MMBtu)	2037 653915 34779 Natural Gas - Energy Equivalent (MMBtu) 2038 672372 35761 Natural Gas - Energy Equivalent (MMBtu)	20371135612372038116766391	133314 Diesel - On Road VMT 135980 Diesel - On Road VMT	2037 85006047 2038 87405258	<ul><li>14 Annual Gas Production (scf / Year)</li><li>15 Annual Gas Production (scf / Year)</li></ul>
2039 1651471 87836 Natural Gas - Energy Equivalent (MMBtu) 2040 1698082 90315 Natural Gas - Energy Equivalent (MMBtu)	2039 691349 36770 Natural Gas - Energy Equivalent (MMBtu) 2040 710861 37808 Natural Gas - Energy Equivalent (MMBtu)	2039 120062007 2040 123450638	138699 Diesel - On Road VMT 142186 Diesel - On Road VMT	2039 89872185 2040 92408738	<ul><li>15 Annual Gas Production (scf / Year)</li><li>16 Annual Gas Production (scf / Year)</li></ul>
2041 1746008 92864 Natural Gas - Energy Equivalent (MMBtu) 2042 1795288 95485 Natural Gas - Energy Equivalent (MMBtu)	2041 730925 38875 Natural Gas - Energy Equivalent (MMBtu) 2042 751554 39973 Natural Gas - Energy Equivalent (MMBtu)	2041 126934910 2042 130517522	145761 Diesel - On Road VMT 149425 Diesel - On Road VMT	2041 95016883 2042 97698641	<ul><li>16 Annual Gas Production (scf / Year)</li><li>16 Annual Gas Production (scf / Year)</li></ul>
2043 1845958 98180 Natural Gas - Energy Equivalent (MMBtu) 2044 1898058 100951 Natural Gas - Energy Equivalent (MMBtu)	2043 772766 41101 Natural Gas - Energy Equivalent (MMBtu) 2044 794577 42261 Natural Gas - Energy Equivalent (MMBtu)	2043 134201250 2044 137988947	153181 Diesel - On Road VMT 157032 Diesel - On Road VMT	2043 1E+08 2044 1.03E+08	<ul><li>17 Annual Gas Production (scf / Year)</li><li>17 Annual Gas Production (scf / Year)</li></ul>
2045 1951629 103800 Natural Gas - Energy Equivalent (MMBtu)	2045 817003 43454 Natural Gas - Energy Equivalent (MMBtu)	20451418835482020716641	161303 Diesel - On Road VMT 73 CNG - On Road VMT	2045 1.06E+08 2020 91527	18 Annual Gas Production (scf / Year) 212 Process N2O Population Served
		2021       736867         2022       757665	73 CNG - On Road VMT 73 CNG - On Road VMT	2021 94110 2022 96766	218 Process N2O Population Served 224 Process N2O Population Served
		2023       779049         2024       801037	73 CNG - On Road VMT 73 CNG - On Road VMT	2023 99498 2024 102306	<ul><li>231 Process N2O Population Served</li><li>237 Process N2O Population Served</li></ul>
		20258236462026846892	73 CNG - On Road VMT 74 CNG - On Road VMT	2025 105193 2026 108162	<ul><li>244 Process N2O Population Served</li><li>251 Process N2O Population Served</li></ul>
		20278707952028895372	74 CNG - On Road VMT 74 CNG - On Road VMT	2027 111215 2028 114354	<ul><li>258 Process N2O Population Served</li><li>265 Process N2O Population Served</li></ul>
		20299206432030946627	75 CNG - On Road VMT 76 CNG - On Road VMT	2029 117581 2030 120900	<ul><li>273 Process N2O Population Served</li><li>280 Process N2O Population Served</li></ul>
		2031 973345 2032 1000817	77 CNG - On Road VMT 78 CNG - On Road VMT	2031 124312 2032 127821	288 Process N2O Population Served 296 Process N2O Population Served
		2033 1029064 2034 1058108	79 CNG - On Road VMT 80 CNG - On Road VMT	2033 131429 2034 135138	305 Process N2O Population Served 313 Process N2O Population Served
		2035108797220361118679	81 CNG - On Road VMT 83 CNG - On Road VMT	2035 138952 2036 142874	322 Process N2O Population Served 331 Process N2O Population Served
		2037115025320381182717	85 CNG - On Road VMT 86 CNG - On Road VMT	2037 146906 2038 151053	341 Process N2O Population Served 350 Process N2O Population Served
		2039       1216098         2040       1250422	88 CNG - On Road VMT 90 CNG - On Road VMT	2039 155316 2040 159700	360 Process N2O Population Served 370 Process N2O Population Served
		2041128571420421322001	92 CNG - On Road VMT 95 CNG - On Road VMT	2041 164207 2042 168842	381 Process N2O Population Served 392 Process N2O Population Served
		2043135931420441397679	97 CNG - On Road VMT 100 CNG - On Road VMT	2043 173607 2044 178507	403 Process N2O Population Served 414 Process N2O Population Served
		204514371272020270848	102 CNG - On Road VMT 20247 Agricultural - Energy Equivalent (MMBtu)	2045 183545 2020 42484	426 Process N2O Population Served 928 Water Supply Energy Equivalent (MMBtu)
		2021       278493         2022       286353	19944 Agricultural - Energy Equivalent (MMBtu) 19646 Agricultural - Energy Equivalent (MMBtu)	2021 40700 2022 38991	914 Water Supply Energy Equivalent (MMBtu) 901 Water Supply Energy Equivalent (MMBtu)
		2023       294435         2024       302745	19352 Agricultural - Energy Equivalent (MMBtu) 19063 Agricultural - Energy Equivalent (MMBtu)	2023 37353 2024 35784	887 Water Supply Energy Equivalent (MMBtu) 874 Water Supply Energy Equivalent (MMBtu)
		2025       311290         2026       320076	18777 Agricultural - Energy Equivalent (MMBtu) 18496 Agricultural - Energy Equivalent (MMBtu)	202534281202632841	861 Water Supply Energy Equivalent (MMBtu) 848 Water Supply Energy Equivalent (MMBtu)
		2027     329110       2028     338398	18220 Agricultural - Energy Equivalent (MMBtu) 17947 Agricultural - Energy Equivalent (MMBtu)	2027 31462 2028 30141	835 Water Supply Energy Equivalent (MMBtu) 823 Water Supply Energy Equivalent (MMBtu)
		2029 347949 2030 357770	17679 Agricultural - Energy Equivalent (MMBtu) 17414 Agricultural - Energy Equivalent (MMBtu)	2029 28875 2030 27662	811 Water Supply Energy Equivalent (MMBtu) 798 Water Supply Energy Equivalent (MMBtu)
		2031     367868       2032     378250	17906 Agricultural - Energy Equivalent (MMBtu) 18411 Agricultural - Energy Equivalent (MMBtu)	2031     27662       2032     27662	821 Water Supply Energy Equivalent (MMBtu) 844 Water Supply Energy Equivalent (MMBtu)
		2033 388926 2034 399903	18931 Agricultural - Energy Equivalent (MMBtu) 19465 Agricultural - Energy Equivalent (MMBtu)	2033 27662 2034 27662	868 Water Supply Energy Equivalent (MMBtu) 892 Water Supply Energy Equivalent (MMBtu)
		2035 411190 2036 422795	20014 Agricultural - Energy Equivalent (MMBtu) 20579 Agricultural - Energy Equivalent (MMBtu)	2035 27662 2036 27662	918 Water Supply Energy Equivalent (MMBtu) 944 Water Supply Energy Equivalent (MMBtu)
		2037 434728 2038 446998	21160 Agricultural - Energy Equivalent (MMBtu) 21757 Agricultural - Energy Equivalent (MMBtu)	2037 27662 2038 27662	970 Water Supply Energy Equivalent (MMBtu) 998 Water Supply Energy Equivalent (MMBtu)
		2039 459614 2040 472586	22371 Agricultural - Energy Equivalent (MMBtu) 23003 Agricultural - Energy Equivalent (MMBtu)	2039 27662 2040 27662	1026 Water Supply Energy Equivalent (MMBtu)  1055 Water Supply Energy Equivalent (MMBtu)
		2041       485925         2042       499639	23652 Agricultural - Energy Equivalent (MMBtu) 24319 Agricultural - Energy Equivalent (MMBtu)	204127662204227662	1084 Water Supply Energy Equivalent (MMBtu) 1115 Water Supply Energy Equivalent (MMBtu)
		20435137412044528241	25006 Agricultural - Energy Equivalent (MMBtu) 25712 Agricultural - Energy Equivalent (MMBtu)	2043 27662 2044 27662	1147 Water Supply Energy Equivalent (MMBtu) 1179 Water Supply Energy Equivalent (MMBtu)
		2045       543150         2020       159377	26437 Agricultural - Energy Equivalent (MMBtu) 11886 Construction - Energy Equivalent (MMBtu)	2045       27662         2020       91	1212 Water Supply Energy Equivalent (MMBtu) 69 Daily N Load at Facility with Release to Environment (kg N/day)
		2021 163875 2022 168500	11709 Construction - Energy Equivalent (MMBtu) 11533 Construction - Energy Equivalent (MMBtu)	2021 93 2022 96	71 Daily N Load at Facility with Release to Environment (kg N/day) 73 Daily N Load at Facility with Release to Environment (kg N/day)
		2023 173256 2024 178146	11361 Construction - Energy Equivalent (MMBtu) 11191 Construction - Energy Equivalent (MMBtu)	2023 99 2024 101	75 Daily N Load at Facility with Release to Environment (kg N/day) 77 Daily N Load at Facility with Release to Environment (kg N/day)
		2025 183174 2026 188344	11023 Construction - Energy Equivalent (MMBtu) 10859 Construction - Energy Equivalent (MMBtu)	2025 104 2026 107	79 Daily N Load at Facility with Release to Environment (kg N/day) 81 Daily N Load at Facility with Release to Environment (kg N/day)
		2027       193660         2028       199125	10696 Construction - Energy Equivalent (MMBtu) 10536 Construction - Energy Equivalent (MMBtu)	2027     110       2028     113	84 Daily N Load at Facility with Release to Environment (kg N/day) 86 Daily N Load at Facility with Release to Environment (kg N/day)
		2029       204746         2030       210524	10378 Construction - Energy Equivalent (MMBtu) 10223 Construction - Energy Equivalent (MMBtu)	2029     116       2030     120	88 Daily N Load at Facility with Release to Environment (kg N/day) 91 Daily N Load at Facility with Release to Environment (kg N/day)
		2031 216466 2032 222576	10512 Construction - Energy Equivalent (MMBtu) 10808 Construction - Energy Equivalent (MMBtu)	2031 123 2032 127	94 Daily N Load at Facility with Release to Environment (kg N/day) 96 Daily N Load at Facility with Release to Environment (kg N/day)
		2033       228858         2034       235317	11113 Construction - Energy Equivalent (MMBtu) 11427 Construction - Energy Equivalent (MMBtu)	2033 130 2034 134	99 Daily N Load at Facility with Release to Environment (kg N/day) 102 Daily N Load at Facility with Release to Environment (kg N/day)
		2035       241959         2036       248788	11750 Construction - Energy Equivalent (MMBtu) 12081 Construction - Energy Equivalent (MMBtu)	2035 138 2036 141	105 Daily N Load at Facility with Release to Environment (kg N/day) 108 Daily N Load at Facility with Release to Environment (kg N/day)
		2037     255809       2038     263029	12422 Construction - Energy Equivalent (MMBtu) 12773 Construction - Energy Equivalent (MMBtu)	2037 145 2038 150	111 Daily N Load at Facility with Release to Environment (kg N/day) 114 Daily N Load at Facility with Release to Environment (kg N/day)
		20392704532040278086	13133 Construction - Energy Equivalent (MMBtu) 13504 Construction - Energy Equivalent (MMBtu)	2039 154 2040 158	117 Daily N Load at Facility with Release to Environment (kg N/day) 120 Daily N Load at Facility with Release to Environment (kg N/day)
		2041 285935	13885 Construction - Energy Equivalent (MMBtu)	2041 163	124 Daily N Load at Facility with Release to Environment (kg N/day)

302303 14680 Construction - Energy Equivalent (MMBtu)

310836 15094 Construction - Energy Equivalent (MMBtu)

319609 15520 Construction - Energy Equivalent (MMBtu)

14277 Construction - Energy Equivalent (MMBtu)

2042

Solid Waste Year Usage CO2e Output Name 2020 92698 56157 All - Waste Generated (wet tons) 2021 95315 57742 All - Waste Generated (wet tons) 2022 98005 59372 All - Waste Generated (wet tons) 2023 100771 61048 All - Waste Generated (wet tons) 2024 103615 62771 All - Waste Generated (wet tons) 2025 106539 64542 All - Waste Generated (wet tons) 2026 109546 66364 All - Waste Generated (wet tons) 2027 112638 68237 All - Waste Generated (wet tons) 2028 115817 70163 All - Waste Generated (wet tons) 2029 119086 72143 All - Waste Generated (wet tons) 2030 122447 74179 All - Waste Generated (wet tons) 2031 125903 76273 All - Waste Generated (wet tons) 2032 129457 78426 All - Waste Generated (wet tons) 2033 133110 80639 All - Waste Generated (wet tons) 2034 136867 82915 All - Waste Generated (wet tons) 2035 140730 85256 All - Waste Generated (wet tons) 2036 144702 87662 All - Waste Generated (wet tons) 2037 148786 90136 All - Waste Generated (wet tons) 2038 152986 92680 All - Waste Generated (wet tons) 2039 157304 95296 All - Waste Generated (wet tons) 2040 161743 97985 All - Waste Generated (wet tons) 2041 166308 100751 All - Waste Generated (wet tons) 2042 171002 103595 All - Waste Generated (wet tons) 2043 175829 106518 All - Waste Generated (wet tons) 2044 180791 109525 All - Waste Generated (wet tons) 2045 185894 112616 All - Waste Generated (wet tons)

127 Daily N Load at Facility with Release to Environment (kg N/day)

131 Daily N Load at Facility with Release to Environment (kg N/day)

134 Daily N Load at Facility with Release to Environment (kg N/day)

138 Daily N Load at Facility with Release to Environment (kg N/day)

2042 167

2043 172

2044 177

2045 182

2039 154 117 Daily N Load at Facility with Release to Environment (kg N/day)
2040 158 120 Daily N Load at Facility with Release to Environment (kg N/day)
2041 163 124 Daily N Load at Facility with Release to Environment (kg N/day)
2042 167 127 Daily N Load at Facility with Release to Environment (kg N/day)
2043 172 131 Daily N Load at Facility with Release to Environment (kg N/day)
2044 177 134 Daily N Load at Facility with Release to Environment (kg N/day)
2045 182 138 Daily N Load at Facility with Release to Environment (kg N/day)

COVERNMENT EMISSIONS TRANSIT VISIT US-989 CO22 OUT- 2002 200880 330 Diesel-Transit VMT 2012 200880 320 Diesel-Transit VMT 2012 200880 320 Diesel-Transit VMT 2012 219180 325 Diesel-Transit VMT 2012 219180 325 Diesel-Transit VMT 2012 219180 325 Diesel-Transit VMT 2012 221512 323 Diesel-Transit VMT 2012 220562 32570 322 Diesel-Transit VMT 2013 237157 325 Diesel-Transit VMT 2013 237157 325 Diesel-Transit VMT 2013 247784 374 Diesel-Transit VMT 2013 247784 374 Diesel-Transit VMT 2015 265880 320 Diesel-Transit VMT 2026 265313 341 Diesel-Transit VMT 2036 265313 341 Diesel-Transit VMT 2038 276974 345 Diesel-Transit VMT 2039 28560 350 Diesel-Transit VMT 2040 285700 350 Diesel-Transit VMT 2040 285700 350 Diesel-Transit VMT 2041 297987 375 Diesel-Transit VMT 2044 320442 320442 465 Diesel-Transit VMT 2044 320442 465 Diesel-Transit VMT 2044 320442 465 Diesel-Transit VMT 2045 28680 414 Diesel-Transit VMT 2046 28680 414 Diesel-Transit VMT 2047 2058 28680 414 Diesel-Transit VMT 2048 28690 414 Diesel-Transit VMT 2049 28690 414 Diesel-Transit VMT 2040 28690 414 Diesel-Transit VMT 2041 28690 414 Diesel-Transit VMT 2040 28690 414 Diesel-Transit VMT 2041 326900 414 Diesel-Transit VMT	Delictings and Facultiles	Common	Venitode Fleet Vary Usage CO22: Ourgott Name 2021 177036 1446 Gissolime- Fleet Venicle VMT 2022 177036 147 (2004) 1400 (2004) 2022 120708 1407 (2004) 1400 (2004) 2024 120708 1400 (2004) 2025 120809 13000 (2004) 2022 120809 13000 (2004) 20212 120809 12022 12022 12020 (2004) 12022 12022 12020 (2004) 12022 12022 (2004) 12022 12022 (2004) 12022 12022 (2004) 12022 (2004) 12022 12022 (2004)	Visu	Employee Commute   Vision   Vision	Visit
						2045   226

## APPENDIX C

# Local Climate Change Snapshot



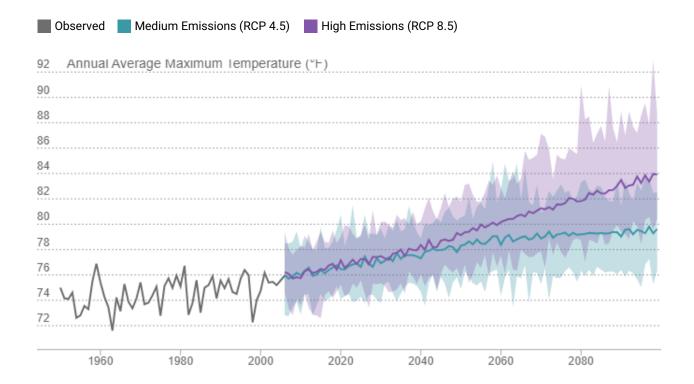
Manteca California

## Temperature

Overall temperatures are projected to rise in California during the 21st century. While the entire state will experience temperature increases, the local impacts will vary greatly with many communities and ecosystems already experiencing the effects of rising temperatures.

#### **Annual Average Maximum Temperature**

Average of all the hottest daily temperatures in a year.



Observed	(1961-1990)	30vr Average: 74.4 °F
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	Change from baseline (i)	30yr Average	30yr Range
Baseline (1961-1990)			
MODELED HISTORICAL	-	74.4 °F	74.2 - 74.7 °F
Mid-Century (2035-2064)			
MEDIUM EMISSIONS (RCP 4.5)	+3.8 °F	78.2 °F	76.8 - 79.5 °F
HIGH EMISSIONS (RCP 8.5)	+4.7 °F	79.1 °F	77.1 - 81.1 °F
End-Century (2070-2099)			
MEDIUM EMISSIONS (RCP 4.5)	+4.9 °F	79.3 °F	77.2 - 81.6 °F
HIGH EMISSIONS (RCP 8.5)	+8.1 °F	82.5 °F	79.6 - 86.7 °F

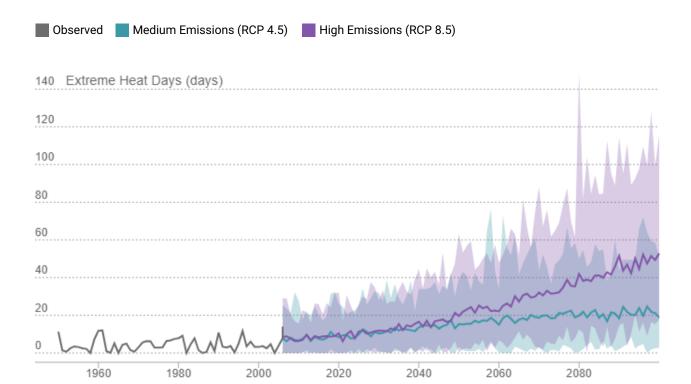
<sup>1.</sup> Data derived from 32 LOCA downscaled climate projections generated to support California's Fourth Climate Change Assessment. Details are described in Pierce et al., 2018.

<sup>2.</sup> Observed historical data derived from Gridded Observed Meteorological Data. Details are described in Livneh et al., 2015.

<sup>3.</sup> Data presented are aggregated over all LOCA grid cells that intersect Manteca boundary.

#### **Extreme Heat Days**

Number of days in a year when daily maximum temperature is above a threshold temperature



Observed	(1961-1990)	30yr Average: 4 days
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	Change from baseline (i)	30yr Average	30yr Range
Baseline (1961-1990)			
MODELED HISTORICAL	-	4 days	3 - 5 days
Mid-Century (2035-2064)			
MEDIUM EMISSIONS (RCP 4.5)	+11 days	15 days	7 - 27 days
HIGH EMISSIONS (RCP 8.5)	+16 days	20 days	9 - 39 days
End-Century (2070-2099)			
MEDIUM EMISSIONS (RCP 4.5)	+17 days	21 days	8 - 43 days
HIGH EMISSIONS (RCP 8.5)	+37 days	41 days	22 - 81 days

<sup>1.</sup> Data derived from 32 LOCA downscaled climate projections generated to support California's Fourth Climate Change Assessment. Details are described in Pierce et al., 2018.

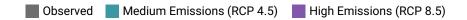
<sup>2.</sup> Observed historical data derived from Gridded Observed Meteorological Data. Details are described in Livneh et al., 2015.

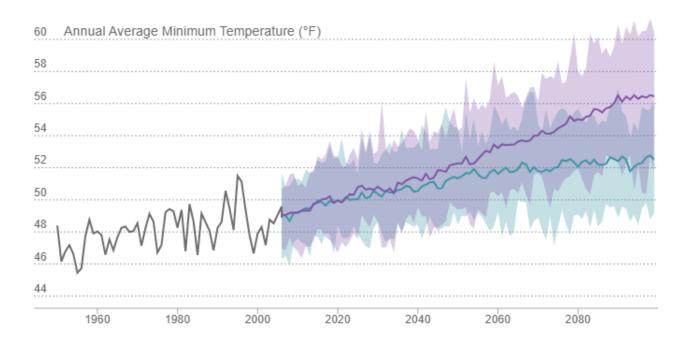
<sup>3.</sup> Data presented are aggregated over all LOCA grid cells that intersect Manteca boundary.

<sup>4.</sup> Threshold temperature for a location is defined as the 98th percentile value of historical daily maximum/minimum temperatures (from 1961–1990, between April and October) observed at that location.

#### **Annual Average Minimum Temperature**

Average of all coldest daily temperatures in a year.





Observed (1961-1990) 30yr Average: 48.1 °F

	Change from baseline (i)	30yr Average	30yr Range
Baseline (1961-1990)			
MODELED HISTORICAL	-	48.0 °F	47.6 - 48.4 °F
Mid-Century (2035-2064)			
MEDIUM EMISSIONS (RCP 4.5)	+3.3 °F	51.3 °F	49.6 - 52.6 °F
HIGH EMISSIONS (RCP 8.5)	+4.2 °F	52.2 °F	50.3 - 53.9 °F
End-Century (2070-2099)			
MEDIUM EMISSIONS (RCP 4.5)	+4.3 °F	52.3 °F	49.7 - 54.3 °F
HIGH EMISSIONS (RCP 8.5)	+7.4 °F	55.4 °F	52.1 - 58.2 °F

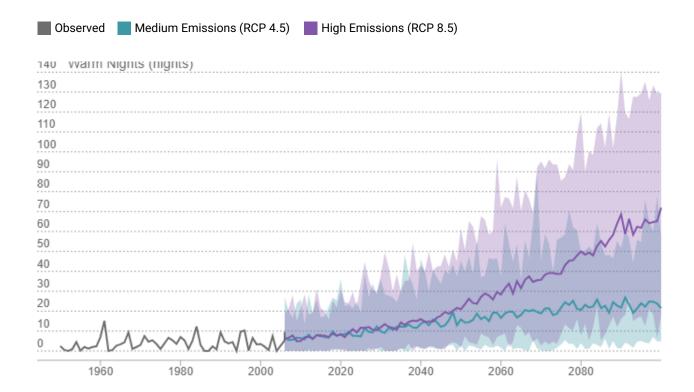
<sup>1.</sup> Data derived from 32 LOCA downscaled climate projections generated to support California's Fourth Climate Change Assessment. Details are described in Pierce et al., 2018.

<sup>2.</sup> Observed historical data derived from Gridded Observed Meteorological Data. Details are described in Livneh et al., 2015.

<sup>3.</sup> Data presented are aggregated over all LOCA grid cells that intersect Manteca boundary.

#### **Warm Nights**

Number of days in a year when daily minimum temperature is above a threshold temperature



<b>Observed (1961-1990)</b> 30yr Average: 4 ni	IIGIILO	
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	Change from baseline (i)	30yr Average	30yr Range
Baseline (1961-1990)			
MODELED HISTORICAL	-	3 nights	1 - 7 nights
Mid-Century (2035-2064)			
MEDIUM EMISSIONS (RCP 4.5)	+12 nights	15 nights	8 - 28 nights
HIGH EMISSIONS (RCP 8.5)	+19 nights	22 nights	12 - 43 nights
End-Century (2070-2099)			
MEDIUM EMISSIONS (RCP 4.5)	+19 nights	22 nights	8 - 48 nights
HIGH EMISSIONS (RCP 8.5)	+50 nights	53 nights	17 - 101 nights

<sup>1.</sup> Data derived from 32 LOCA downscaled climate projections generated to support California's Fourth Climate Change Assessment. Details are described in Pierce et al., 2018.

<sup>2.</sup> Observed historical data derived from Gridded Observed Meteorological Data. Details are described in Livneh et al., 2015.

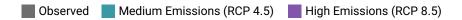
<sup>3.</sup> Data presented are aggregated over all LOCA grid cells that intersect Manteca boundary.

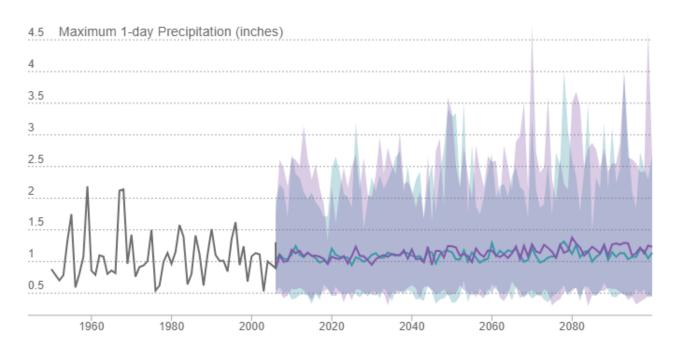
## Precipitation

California's climate varies between wet and dry years. Research suggests that for much of the state, wet years will become wetter and the dry years will become drier. Dry years are also likely to be followed by dry years, increasing the risk of drought. While California does not see the average annual precipitation changing significantly in the next 50-75 years, precipitation will likely be delivered in more intense storms and within a shorter wet season. We are already seeing some of the impacts from a shift towards larger year to year fluctuations.

#### **Maximum 1-day Precipitation**

The maximum daily precipitation amount for each year. In other words, the greatest amount of daily rain or snow (over a 24 hour period) for each year.





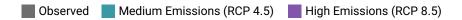
Observed (1961-1990) 30yr Average: 1.093 inches

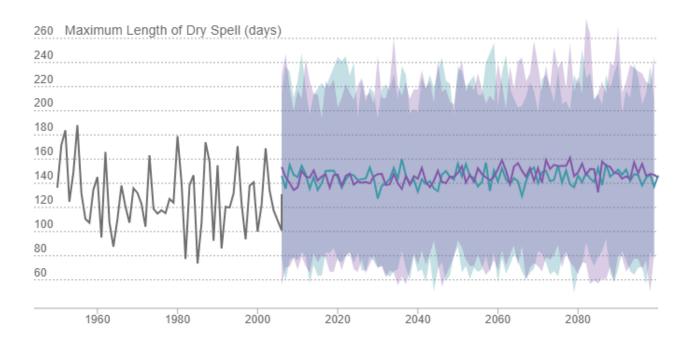
	Change from baseline (i)	30yr Average	30yr Range
Baseline (1961-1990)			
MODELED HISTORICAL	-	1.052 inches	0.943 - 1.172 inches
Mid-Century (2035-2064)			
MEDIUM EMISSIONS (RCP 4.5)	+0.050 inches	1.102 inches	0.925 - 1.470 inches
HIGH EMISSIONS (RCP 8.5)	+0.064 inches	1.116 inches	0.960 - 1.323 inches
End-Century (2070-2099)			
MEDIUM EMISSIONS (RCP 4.5)	+0.069 inches	1.121 inches	0.857 - 1.470 inches
HIGH EMISSIONS (RCP 8.5)	+0.151 inches	1.203 inches	0.895 - 1.704 inches

- 1. Data derived from 32 LOCA downscaled climate projections generated to support California's Fourth Climate Change Assessment. Details are described in Pierce et al., 2018.
- 2. Observed historical data derived from Gridded Observed Meteorological Data. Details are described in Livneh et al., 2015.
- 3. Data presented are aggregated over all LOCA grid cells that intersect Manteca boundary.
- 4. Threshold temperature for a location is defined as the 98th percentile value of historical daily maximum/minimum temperatures (from 1961–1990, between April and October) observed at that location.

#### **Maximum Length of Dry Spell**

The maximum length of dry spell for each year. In other words, the maximum number of consecutive days with precipitation < 1mm for each year.





Observed (1961-1990) 30yr Average: 125 days

	Change from baseline (i)	30yr Average	30yr Range
Baseline (1961-1990)			
MODELED HISTORICAL	-	138 days	125 - 150 days
Mid-Century (2035-2064)			
MEDIUM EMISSIONS (RCP 4.5)	+6 days	144 days	126 - 160 days
HIGH EMISSIONS (RCP 8.5)	+7 days	145 days	124 - 166 days
End-Century (2070-2099)			
MEDIUM EMISSIONS (RCP 4.5)	+7 days	145 days	119 - 163 days
HIGH EMISSIONS (RCP 8.5)	+13 days	151 days	116 - 180 davs

<sup>1.</sup> Data derived from 32 LOCA downscaled climate projections generated to support California's Fourth Climate Change Assessment. Details are described in Pierce et al., 2018.

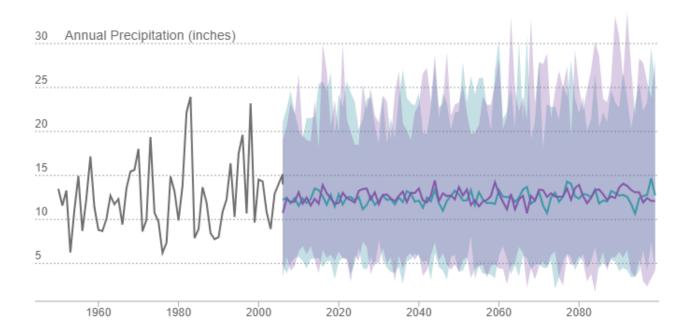
<sup>2.</sup> Observed historical data derived from Gridded Observed Meteorological Data. Details are described in Livneh et al., 2015.

<sup>3.</sup> Data presented are aggregated over all LOCA grid cells that intersect Manteca boundary.

#### **Annual Precipitation**

Total precipitation projected for a year





Observed (1961-1990) 30yr Average: 12.1 inches

	Change from baseline (i)	30yr Average	30yr Range
Baseline (1961-1990)			
MODELED HISTORICAL	-	12.6 inches	11.5 - 13.6 inches
Mid-Century (2035-2064)			
MEDIUM EMISSIONS (RCP 4.5)	-0.2 inches	12.4 inches	10.7 - 17.2 inches
HIGH EMISSIONS (RCP 8.5)	0.0 inches	12.6 inches	10.0 - 15.9 inches
End-Century (2070-2099)			
MEDIUM EMISSIONS (RCP 4.5)	+0.0 inches	12.6 inches	10.1 - 16.1 inches
HIGH EMISSIONS (RCP 8.5)	+0.3 inches	12.9 inches	8.2 - 17.8 inches

<sup>1.</sup> Data derived from 32 LOCA downscaled climate projections generated to support California's Fourth Climate Change Assessment. Details are described in Pierce et al., 2018.

<sup>2.</sup> Observed historical data derived from Gridded Observed Meteorological Data. Details are described in Livneh et al., 2015.

<sup>3.</sup> Data presented are aggregated over all LOCA grid cells that intersect Manteca boundary.